

SNO-WAY[®]

SNOW & ICE CONTROL EQUIPMENT

OWNER'S, INSTALLATION AND PARTS MANUAL

SNO-WAY[®] 4 CUBIC FOOT SPREADER
FOR
SPREADER SERIAL NUMBERS AFTER 4S100000

TABLE OF CONTENTS

	Page
INTRODUCTION	2
SAFETY	3
THEORY OF OPERATION	4
Hopper and Mounting System	4
Power Unit Operation	4
On/Off Control	4
Variable Speed Controller	4
Burst Operation.....	4
Adjustable Speed Operation.....	5
Drive System	5
Flow Gate Operation.....	5
Chunk Buster System	5
SPREADING OPERATION	6
Spreading Mediums.....	6
Operating Capacities.....	6
Before The Season Begins	6
Transporting Vehicle With Spreader Attached.....	7
Spreading Like A Pro.....	7
Mounting Spreader To Vehicle.....	7
Checking Spinner Shaft Rotation.....	9
Before You Use Spreader.....	9
Removing Spreader From Vehicle.....	10
Operating The Spreader With The On/Off Control.....	11
Operating The Spreader With The Variable Control	11
Variables Affecting Spreading Material Discharge	11
Adjusting Flow Gate - Spreading Pattern	12
On/Off Motor Controller Operation.....	12
Variable Motor Controller Operation	13
TROUBLESHOOTING	15
MAINTENANCE	16
Polyethylene Hopper Care	16
Polyethylene Hopper Cleaning Instructions.....	16
Lubrication Requirements	16
Controller Service (On/Off or Variable).....	16
Motor Service	16
Drive Belt Adjustment	16
Metri-Pack™ Connector Removal	17
Metri Pack™ Connector Replacement	18
TORQUE SPECIFICATIONS.....	20
WIRING SCHEMATIC (On-Off Control).....	21
WIRING SCHEMATIC (Variable Control)	22
PARTS LIST INTRODUCTION.....	23
HOPPER FRAME	24
DRIVE.....	25
ELECTRICAL (Variable Control).....	26
ELECTRICAL (On/Off Control).....	27
WIRE HARNESS INSTALLATION	28
NUMERICAL INDEX	32
DEALER CHECKLISTS.....	Back Cover

INTRODUCTION

This manual was written for the assembly, installation and maintenance of your new SNO-WAY® 4 CUBIC FOOT SPREADER. Most importantly, this manual provides an operating plan for safe use. Refer to the Table of Contents for an outline of this manual.

Please keep this manual with your machine at all times as reference material and so it can be passed on to the next owner if the machine is sold.

We require that you read and understand the contents of this manual COMPLETELY, especially the chapter on SAFETY, before attempting any procedure contained in this manual.



The Society of Automotive Engineers has adopted this SAFETY ALERT SYMBOL to pinpoint characteristics that, if NOT carefully followed, can create a safety hazard. When you see this symbol in this manual or on the machine itself, BE ALERT!, your personal safety and the safety of others, is involved.

• Defined below are the SAFETY ALERT messages and how they will appear in this manual.

	WARNING
FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.	

	CAUTION
Information, that if not carefully followed, can cause injury or damage to equipment!	

BE AWARE! It is illegal to remove, deface or otherwise alter the safety decals mounted on this equipment.

Record the Spreader Serial Number, Controller Serial Number and Spreader Model Number in the space provided below, as a handy record for quick reference. The Serial Number is located on the right upright of the hopper frame. This plate contains information that your

Dealer needs; to answer questions, to order replacement parts, or to complete warranty work (if needed) for your unit.

We reserve the right to make changes or improve the design or construction of any part(s) without incurring the obligation to install such parts or make any changes on any unit previously delivered.

NAME PLATE DATA	
SPREADER MODEL NUMBER _____	
SPREADER SERIAL NUMBER _____ <small>(Located on Hopper Frame)</small>	
CONTROLLER SERIAL NUMBER _____ <small>(Located on Bottom of Controller)</small>	
(FILL IN)	

DEALER	
NAME _____	
ADDRESS _____	
CITY _____ STATE _____ ZIP _____	
PHONE (____) _____	
(FILL IN)	

ORIGINAL PURCHASER	
NAME _____	
ADDRESS _____	
CITY _____ STATE _____ ZIP _____	
PHONE (____) _____	
(FILL IN)	



SAFETY



BEFORE ATTEMPTING ANY PROCEDURE IN THIS BOOK, READ AND UNDERSTAND ALL THE SAFETY INFORMATION CONTAINED IN THIS SECTION. IN ADDITION, ENSURE ALL INDIVIDUALS WORKING WITH YOU ARE ALSO FAMILIAR WITH THESE SAFETY PRECAUTIONS.

For your safety Warning and Information Decals have been placed on this product to remind the operator to take safety precautions. It is important that these decals are in place and are legible before operation begins. New decals can be obtained from Sno-Way or your local dealer.

REMEMBER The careful operator is the best operator. Most accidents are caused by human error. Certain precautions must be observed to prevent the possibility of injury to operator or bystanders and/or damage to equipment.

NEVER exceed vehicle GVWR, GAWR or Vehicle Hitch Tongue Weight Rating.

NEVER operate spreader when under the influence of alcohol, drugs or other medications that could hamper your judgement and reactions. An accident may result in serious injury or death to other persons or yourself.

ALWAYS operate vehicle in a well-ventilated area. The carbon monoxide in exhaust gas is highly toxic and can cause serious injury or death.

NEVER allow hands, hair or clothing to get near any moving parts such as fan blades, belts and pulleys. Never wear neckties or loose clothing when working on the vehicle or Spreader.

NEVER wear wrist watches, rings or other jewelry when working on the vehicle or individual equipment. These things can catch on moving parts or cause an electrical short circuit that could result in serious personal injury.

ALWAYS wear safety goggles when working on the vehicle to protect your eyes from battery acid, gasoline, and dust or dirt from flying off of moving engine parts.

ALWAYS be aware of and avoid contact with hot surfaces such as engine, radiator, and hoses.

ALWAYS wear safety glasses with side shields when striking metal against metal! In addition, it is recommended that a softer (non-chipable) metal material be used to cushion the blow. Failure to heed could result in serious injury to the eye(s) or other parts of the body.

NEVER allow children or unauthorized person to operate this spreader.

NEVER exceed 45 m.p.h. when loaded spreader is attached to vehicle. Braking distances may be reduced and handling characteristics may be impaired at speeds above 45 m.p.h. It is strongly recommended to load the spreader at the job site and to dispense all of the

materials at the job site. Transportation of a loaded spreader causes the material to become impacted and may cause spreader flow problems.

ALWAYS lock the vehicle when unattended to prevent unauthorized operation.

ALWAYS check the job site for terrain hazards, obstructions and people.

ALWAYS check surrounding area for hazardous obstacles before operating this unit.

ALWAYS inspect the unit periodically for defects. Parts that are broken, missing or plainly worn must be replaced immediately. The unit, or any part of it should not be altered without prior written approval of the manufacturer.

ALWAYS shut off the vehicle engine, place the transmission in Park, turn the ignition switch to the "OFF" position and firmly apply the parking brake of the vehicle before attaching or detaching the spreader from the vehicle or when making adjustments to the spreader gates and/or deflectors.

ALWAYS make sure personnel are clear of area being spread. Material is discharged from spreader at a high rate of speed and could injure bystanders.

ALWAYS inspect bolts and pins whenever attaching or detaching the spreader, and before traveling. Worn or damaged components could result in the spreader dropping to the pavement while driving, causing an accident.

NEVER place fingers in mounting frame or mount lug holes to check alignment when attaching spreader. Sudden motion of the spreader frame could severely injure a finger.

NEVER use material in the spreader containing twigs, brush, plastics, cans or other trash. Foreign materials could plug drive and discharge and damage unit.

NEVER use wet materials in the spreader. This unit is not designed to handle wet materials. Use only dry free flowing materials.

NEVER leave materials in hopper for long periods of time. Remember salt is hygroscopic and will attract enough atmospheric moisture to cause it to "cake".

NEVER work on the vehicle without having a fully serviced fire extinguisher available. A 5 lb or larger CO² or dry chemical unit specified for gasoline, chemical or electrical fires, is recommended.

NEVER smoke while working on the vehicle. Gasoline and battery acid vapors are extremely flammable and explosive.

REMEMBER it is the owner's responsibility for communicating information on the safe use and proper maintenance of this machine.

THEORY OF OPERATION



Hopper and Mounting System

The hopper is manufactured out of a corrosion resistant, polyethylene polymer with lower temperature and UV stabilizers to provide a long, service free, life.

The hopper is mounted in a channel steel frame that is powder coated for corrosion resistance.

The frame is a hitch mount type where the spreader hitch tube is inserted into a standard receiver hitch.

Total gross weight of the 4 Cubic Foot Spreader AND spreading medium should not exceed vehicle hitch tongue weight rating. Empty spreader weight is 95 lb.

 WARNING	
	<p>Total gross weight of the 4 Cubic Foot Spreader AND spreading medium should not exceed vehicle hitch tongue weight rating. Empty spreader weight is 95 lb.</p> <p>FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.</p>

The benefit of the hitch mount spreader is that it can be taken off of the truck easily and stored. No additional brackets are required.

Power Unit Operation

The drive unit consists of a 12V DC motor, motor sheave, drive belt, adjustable belt tensioner, driven sheave, drive shaft, and shaft support bearings.

Control of the motor is accomplished by cab mounted controller.

IMPORTANT: Extended operation can cause overheating and permanent damage to the spreader motor. (See Figure 1-1) for Operating/Cooling Time chart.

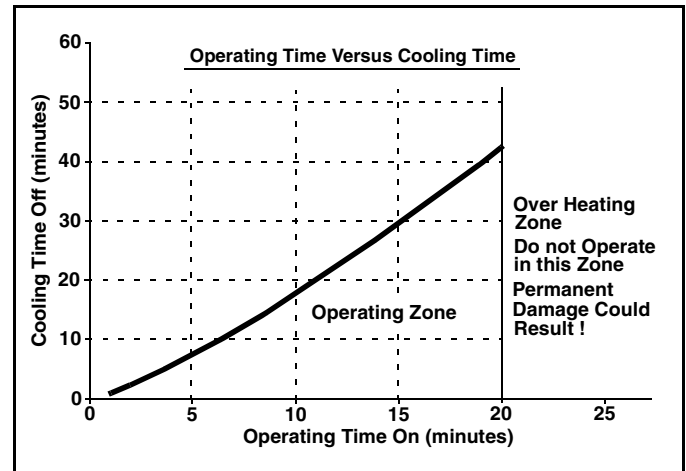


Figure 1-1

On/Off Control

The ON/OFF switch only has one speed. Turn the switch ON and the motor turns on full spread speed. Turn the switch OFF and the motor turns off and the unit stops spreading.

Variable Speed Controller

The Variable Speed Control unit is turned on by the operator depressing the START switch. The power will automatically cycle at full torque and rpm to give an initial burst of materials and to insure that the spinner reaches optimum speed rapidly. The unit will then operate at the pre-selected speed until the unit is shut off by the operator depressing the OFF switch.

Burst Operation

Depressing the START switch engages the BURST feature of the SNO-WAY® 4 CUBIC FOOT SPREADER. As long as the START switch is depressed the Spreader will operate at maximum speed regardless of the setting on the speed controller. This gives the operator the option of applying extra material on particularly slippery locations without having to adjust the flow control.

When the operator releases the START switch, the BURST feature will stop and normal spreader operation will resume.

Adjustable Speed Operation

Speed of the spinner is controlled by the operator, from the cab, by turning the knob on the control unit clockwise for increased flow, or counterclockwise for decreased flow.

Drive System

The belt driven spinner shaft runs at approximately 1/4 motor rpm (625 rpm). The spinner shaft is mounted on two bearings, one located under the motor plate and the other located under the spinner assembly.

Both pattern and spread are affected by motor speed. The faster the motor turns, the more material will be discharged over a wider area.

Flow Gate Operation

The SNO-WAY® 4 CUBIC FOOT SPREADER is equipped with a variable flow gate and integral hopper formed deflectors to accurately and precisely dispense materials.

The flow gate controls the volume of material being dispensed and the discharge pattern of the material.

The flow gate operates by moving the white handle and can adjust the spray pattern from full flow to partial flow.

IMPORTANT: The flow gate can become impacted with material, especially if spreader is transported full. If the flow gate becomes impacted, gradually free the handle by "back and forth" motions until handle is free.

Chunk Buster System

The SNO-WAY® 4 CUBIC FOOT SPREADER is equipped with a Chunk Buster System that will break up chunks of material from approximately 1/2 to 1-1/2 inches in diameter.

SPREADING OPERATION

Spreading Mediums

Categories of Spreading Mediums

Spreading Mediums come in three different categories:

- **Free Flowing** - These materials generally have a granular size of 1/8 to 1/4 inch, and have no chunks when poured out.
- **Chunky Free Flowing** - These materials are the same granular size as free flowing, but have chunks or bridging that can range from 1/2 inch in diameter up to 6-12 inches in diameter. These chunks can easily escape visual detection when being poured out of a bag, and give the appearance of free flowing material.
- **Bridging / Non Flow** - These materials chunk up when poured, or stick together and combine into clumps of break resistant material. They may pour well down the side of the hopper, but when wedged together at the bottom of the hopper, materials will be compacted, clump together and resist breakup. Vibration by vibrators tends to compact the materials even more. A physical "breaker" is required to make this material move.

Usable Spreading Mediums

There are a number of spreading mediums that are usable with your SNO-WAY® 4 CUBIC FOOT SPREADER.

Some examples are:

- **Free Flowing Salt, Course and Fine** - Free Flowing Salt typically comes out of a bag and is free of large chunks. Typically, the Chunk Buster in the SNO-WAY® 4 CUBIC FOOT SPREADER should take care of the smaller chunks (1/2 to 1-1/2 inches in diameter) and flow freely through the spreader.
- **Treated Salt, Course and Fine** - Treated Salt is usually more "sticky", and bridges easily. The SNO-WAY® 4 CUBIC FOOT SPREADER requires a vibrator to be added for optimum flow with this material.
- **Calcium Chloride** - Calcium Chloride can become "sticky and chunky". The SNO-WAY® 4 CUBIC FOOT SPREADER requires a vibrator to be added for optimum flow with this material.

NOTE: Due to the different rates at which materials absorb moisture, materials may have different performance characteristics when used in a spreader. The substitution of alternate materials may be necessary for maximized flow and spread patterns.

Operating Capacities

Hopper capacity is approximately 4 Cu. Ft.

NOTE: SNO-WAY® 4 CUBIC FOOT SPREADERS are designed to handle free flowing materials.

IMPORTANT: Sand cannot be spread with SNO-WAY® 4 CUBIC FOOT SPREADERS.

Use the following table as a guide to calculate the weight of material placed in the spreader.

IMPORTANT: Material weights given are average weights for DRY materials. Depending on moisture content of material, weights will vary. NEVER load the vehicle this Spreader is installed on beyond the vehicle manufacturer's maximum Gross Vehicle Weight Rating.

Material	Weight (lbs. Per Cu. Ft.)
Rock Salt Coarse	35
Rock Salt Fine	45
Example: Fine Rock Salt @ 45 lbs/ft ³ x 5ft ³ = 225lbs	

REMEMBER Calcium and Sodium Chloride (Salt) materials are hygroscopic (attract moisture) and will form a solid block when exposed to atmospheric moisture. It is easier to unload unused material and clean out the hopper in a timely manner than chip out a 200 lb hardened salt block later.

Before The Season Begins

1. Inspect the spreader, spreader frame and all attaching hardware for wear and corrosion. Replace worn or damaged parts and clean and repaint exposed metal parts with a high quality, corrosion resistant enamel.


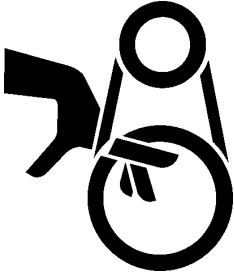
2. Inspect all fasteners to insure that they are properly tightened. If any fasteners are loose, re-tighten to the proper torque (refer to the Torque Specification Chart in this manual) and carefully inspect the adjacent area for damage or wear as well as carefully inspecting all adjacent fasteners for proper torque.

NOTE: All external fasteners which are 1/4"-20 stainless steel hex head capscrews are to be torqued to 20-25 lb-in. maximum, otherwise overtightening can occur.

3. Apply a small amount of light oil to the hitch pin.

4. Install auxiliary and flashing lights as required by local ordinances.



5. Remove the center drive cover and inspect all drive components. Engage the spinner drive to verify that it is operating properly.

 CAUTION	
	Keep hands and clothing away from the drive belt and pulleys whenever the drive operation is being inspected and the drive cover is not installed.

Transporting Vehicle With Spreader Attached


1. Do not exceed 45 mph when driving with the empty spreader attached. Reduce speed when crossing railroad tracks or when road conditions deteriorate.

2. Do not transport with the spreader filled. The weight of a filled spreader could greatly increase braking distance and could dramatically impair vehicle handling. Also, transporting with the spreader filled with material will tend to pack the material and will cause problems when beginning to spread material.

 CAUTION	
	Heavily loaded spreader could cause vehicle handling to be impaired.

3. Inspect spreader attaching hardware for wear or damage before transporting and beginning spreading operations.

Spreading Like A Pro

 WARNING
Wear your seat belt! Contact with a hidden obstruction can cause personal injury from bodily contact within the vehicle cab or whiplash from sudden stops.
FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

1. Become familiar with the area to be treated and mark potential hazards before the snow falls. Many immovable objects cannot be seen when covered with snow. Developing a plan early can save valuable time and equipment damage.

2. Spread with the storm. The “Pros” are out early. Allowing ice to accumulate to unmanageable levels can cause difficult removal problems and can be costly in terms of “wear and tear” on equipment.

3. Research municipal ordinances for restrictions on the allowable materials used for ice control and removal. Many municipalities limit amounts of salt that can be used.

Mounting Spreader To Vehicle

The hitch adapter assembly consists of the hitch tube welded to a half-inch plate. The hitch adapter is bolted to the spreader frame. (See Figure 2-1)

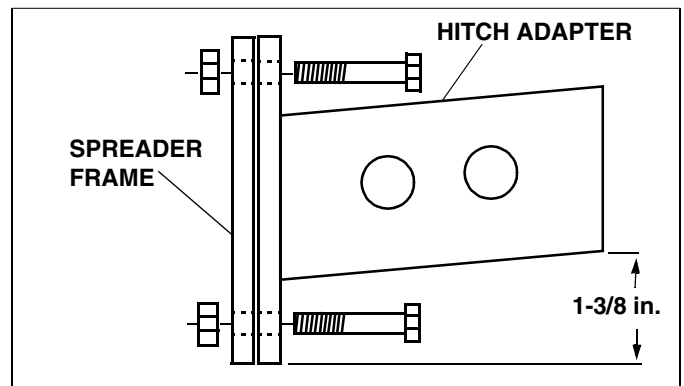




Figure 2-1

1. Assemble the hitch adapter to the spreader:

- Position the adapter so that the top and bottom of the adapter plate are flush with the spreader frame plate. The mounting holes should line up. If they do not, the hitch adapter is upside down. When the

spreader is placed on a flat surface, the hitch tube should be approximately 1-3/8 inches from the surface, or appear to point up.

- Insert the bolts through the adapter and into the spreader mounting plate. Install nuts and tighten to 90 lb-ft.

 CAUTION	
	Spreader hopper and frame weigh 95 lbs. EMPTY. Get help and use proper lifting procedures when installing or removing spreader.

2. Position vehicle as close as possible to the spreader. Set parking brake and turn ignition switch off. Remove key from ignition.

3. Tilt the spreader/ hitch adapter upward and lift spreader to align the adapter with the hitch receiver on the vehicle. Slide the spreader forward until the hitch holes on the side of the hitch receiver and spreader hitch adapter line up. (See Figure 2-2)

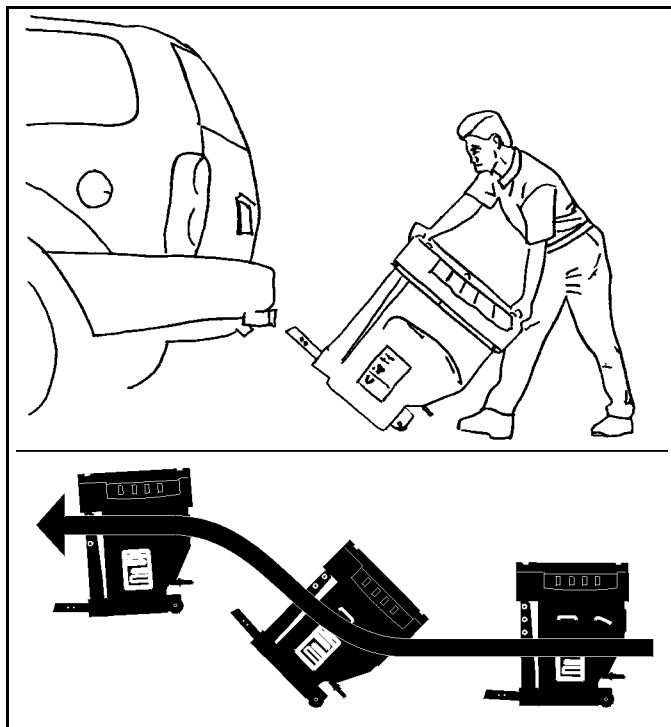




Figure 2-2

 CAUTION	
	NEVER place fingers in mount holes to check alignment. Sudden motion of the frame could severely injure a finger.

4. Slide the bent arm pin through the hitch receiver and hitch adapter and secure it with a spring pin.

 WARNING	
	NEVER mount spreader into hitch without having a bent arm pin and spring pin to hold the spreader in place. FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

5. Connect wire harness from motor to vehicle connector.

Checking Spinner Shaft Rotation

IMPORTANT: Verification of correct direction of spinner rotation should be performed with empty hopper prior to loading spreading medium.

 WARNING	
	<p>NEVER check direction of spinner shaft rotation by looking at spinner, or by using hands to check rotation. Material residue on spinner will cause severe injury to eyes of bystanders upon discharge. Always wear safety glasses, and keep arms, hands and any loose clothing away from rotating spinners and shafts while inspecting spinner.</p> <p>FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.</p>

1. Lift flip lid and verify that hopper is empty of any spreading medium or other material.
2. Turn ignition to ACC position and engage START switch on spreader control.
3. Check spinner shaft for proper rotation. Shaft should rotate clockwise when viewed from top. If shaft rotates counterclockwise:
 - A. Disconnect wire harness at vehicle connector.
 - B. Switch wires in Packard connector. (See pages 13-14 for wiring of Packard connectors.)
 - C. Reconnect wire harness at vehicle connector.
 - D. Re-check rotation of shaft.

Before You Use Spreader

IMPORTANT: Inspection of spreader mechanical components and routine lubrication should be performed with empty hopper so that components are clearly visible and accessible.

 CAUTION
<p>Disconnect wire harness motor connector before lubricating drive components, checking belt tension or spinner freedom of rotation.</p>

IMPORTANT: Lubricate spinner shaft bearings before each use of the spreader. Failure to grease these bearings will result in corrosion of the bearings and will cause the spreader to work inadequately.

1. Grease bearings on spinner shaft. See "Lubrication Requirements" on page 16.

IMPORTANT: Check belt tension before each use of the spreader. Operating unit with incorrect belt tension will cause the spreader to work inadequately.

2. Check belt tension. See "Drive Belt Adjustment" on page 16.

3. Check for freedom of spinner shaft rotation by grasping spinner and turning it by hand. If there is any resistance, check for obstructions and clear as necessary before proceeding. DO NOT attempt to force spinner to rotate, damage to spinner could result.

4. Load material in hopper. See "Spreading Mediums" on page 6.

Removing Spreader From Vehicle


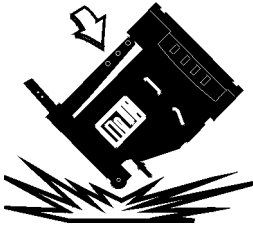
 WARNING	
 	<p>Empty spreader hopper before removing spreader from vehicle. A loaded spreader can be heavy and awkward to remove, with the potential for unpredictable consequences.</p> <p>FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.</p>

1. Drive vehicle to the desired storage area. It is recommended that the spreader be stored in a dry, protected area.

2. Turn vehicle ignition switch to OFF. Remove key. Set park brake.

IMPORTANT: Spreader should be thoroughly cleaned of all material residue, especially salt, before it is put into storage.

REMEMBER Calcium and Sodium Chloride materials are hygroscopic, attract moisture, and will form a solid block when exposed to atmospheric moisture. It is easier to unload unused material and clean out the hopper in a timely manner than chip out a 200 lb hardened salt block later!

 CAUTION	
	<p>Use care when placing hopper/frame assembly on floor. If unit is dropped, the frame can be bent which will cause spinner to jam and/or malfunction.</p>

 CAUTION	
<p>Never use pliers or any other tool to separate the wiring harness connector halves.</p>	

3. Disconnect electrical connections. Cap vehicle end of connector.

4. Remove spring pin and bent arm pin from hitch receiver on vehicle.

5. Slide spreader from hitch receiver and carefully place on floor. (See Figure 2-3)

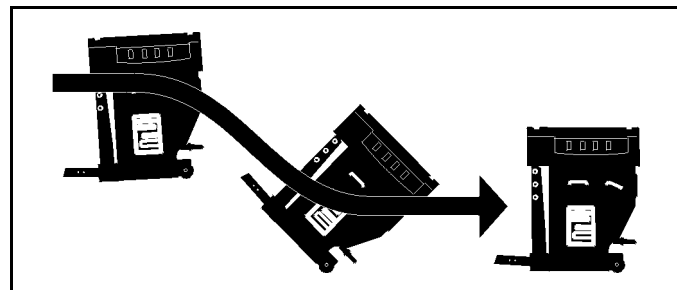


Figure 2-3

6. Tilt and roll spreader to storage location. (See Figure 2-4)

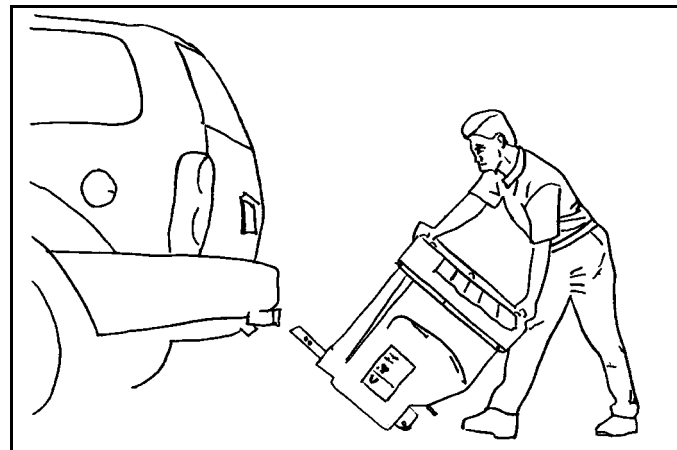


Figure 2-4

Operating The Spreader With The On/Off Control

To Start The Motor

1. Turn ignition key to ACC position or start the engine. This routes power to the controller.
2. Depress switch ON position. The switch will illuminate, indicating that there is power going to the spinner motor.

To Stop The Motor

1. Depress and the switch to the OFF position. The indicator lamp will go off. The motor will stop rotating.

IMPORTANT: If ignition switch is turned off at any time during operation the spinner motor will stop and the controller will automatically reset to the OFF position. Spinner will not automatically be restarted if ignition is turned back ON.

Operating The Spreader With The Variable Control

To Start The Motor

1. Turn ignition key to ACC position or start the engine. This routes power to the controller.
2. Depress and release switch START position. The indicator lamp will come on indicating that there is power going to the spinner motor. Depressing the switch automatically engages the BURST operation for a short time and then returns the motor to a steady speed operation controlled by the speed controller.
3. Adjust the speed by turning the variable speed control knob in a clockwise direction to increase speed, or in a counterclockwise direction to decrease speed.

NOTE: The variable speed control may be adjusted at any time. The unit does not have to be in the start mode. The variable speed controller only controls the steady state running speed of the motor and does not affect the BURST mode of operation.

To Stop The Motor

1. Depress and release the switch STOP position. The indicator lamp will go off. The motor will stop rotating.

IMPORTANT: If ignition switch is turned off at any time during operation the spinner motor will stop and the controller will automatically reset to the OFF position. Spinner will not automatically be restarted if ignition is turned back ON.

Variables Affecting Spreading Material Discharge

The amount of material dispensed is dependent on three factors:

- Spinner Speed
- Gate Position
- Vehicle Speed

Any variation in one or more of the above will result in varied pattern spread, pattern width and the amount of material discharged from the spreader.

Adjusting Flow Gate - Spreading Patterns

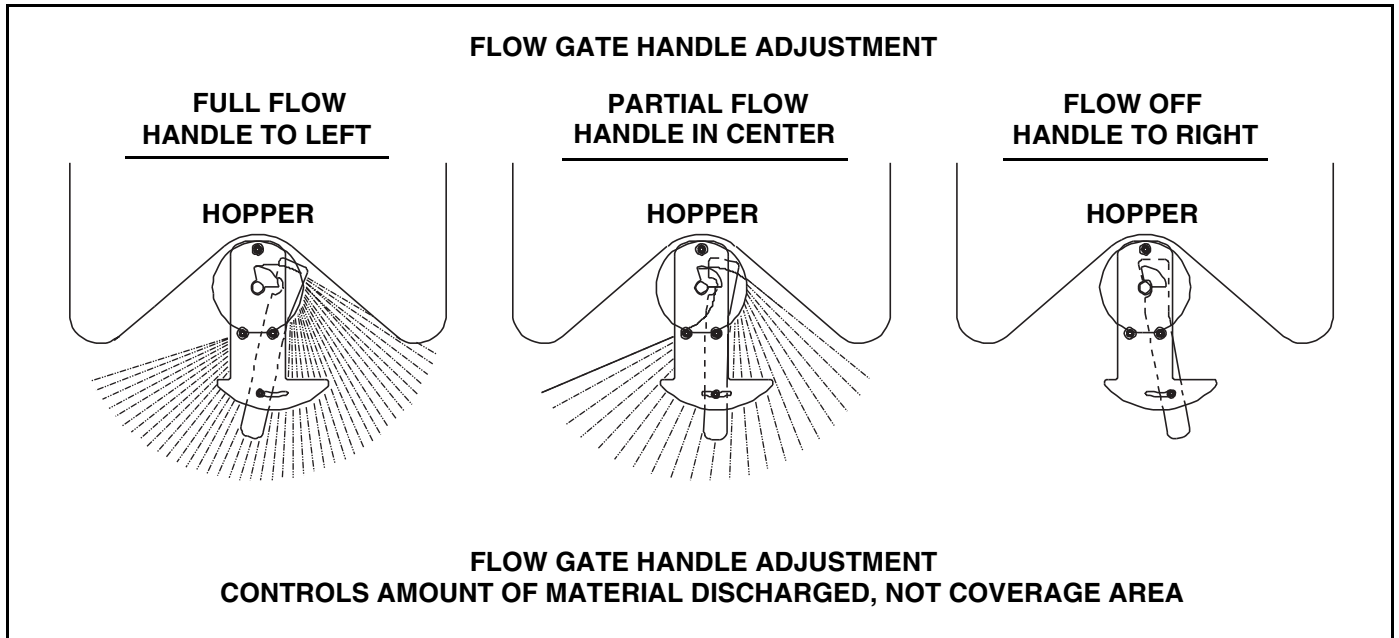


Figure 2-5

Adjusting the flow gate handle allows the operator to modify the spreading pattern for best results and economy of spreading material. (See Figure 2-5)

The positions shown above are not fixed or "preset", and the handle can be adjusted to other "custom" positions if desired.

Once a handle position is selected, a thumbscrew in the gate can be tightened to secure the position. Do not overtighten the screw.

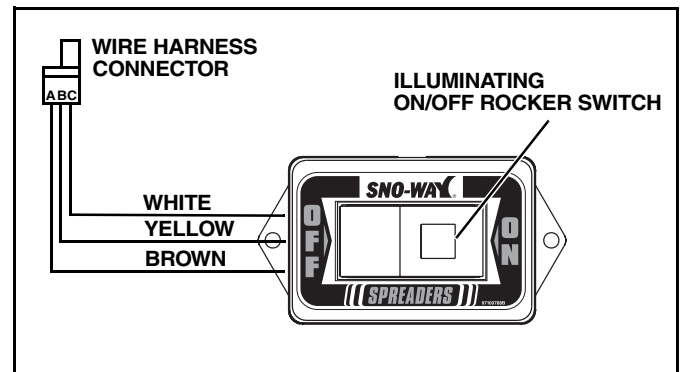


Figure 2-6

On/Off Motor Controller Operation



CAUTION

The controller input voltage must be a minimum of 11 volts DC for proper operation. Be sure the vehicle battery and alternator are in good operating condition and adequate to provide 11 volts DC to the salt spreader controller.

The motor controller controls the speed of the spinner drive motor by supplying set voltage and current to the spinner drive motor. (See Figure 2-6)

Current is supplied by a control power lead (RED wire) from the vehicle fuse block and must be protected by a fuse no greater than 15 amps. This control power lead must also be connected to the fuse block so that the controller receives current **ONLY** when the vehicle ignition is in the ACC position or RUN position. (See "WIRE HARNESS INSTALLATION" on page 28.)

The spinner drive motor is protected by a 25 amp circuit breaker installed in the wiring system near the vehicle battery.

The following control and indicator is located on the face of the control box:

- Illuminating ON/OFF rocker switch—used to start or stop spinner motor. Switch is an illuminating, rocker type switch.

Start:

The ON/OFF switch on the front of the control box is an illuminating rocker switch. When the ON side of the switch is depressed, current will be directed to the spinner drive motor and the indicator light behind the rocker switch will illuminate to indicate that power is ON to the spinner drive motor. Also, when the ON switch is depressed, the motor control will go to FULL.



WARNING

Make sure that the vehicle ignition switch is in the OFF position and key removed from the switch before inspecting the Spreader for cause of obstruction.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

If the spinner drive motor stalls, press the OFF side of the ON/OFF switch to shut off the power to the spinner drive motor. Turn off the vehicle ignition and remove the key from the ignition switch. Inspect the hopper and the spinner drive to determine the cause of the obstruction.

Correct the problem and test to make sure everything is clear, then restart the spinner drive motor.

Disconnect Protection:

The ground wire to the controller circuit must be connected to a good ground on the vehicle to insure proper controller function. In case the control ground is lost, by a disconnected ground wire or poor/improper ground, the controller will automatically shut down. If the ON/OFF switch is depressed (ON) and the switch **DOES NOT** illuminate, it will indicate an improper ground to the controller.

Ignition Switch Shutoff Procedures:

If the vehicle ignition switch is turned OFF while the spreader control is in the ON position, the spinner drive will shut off. When the vehicle ignition switch is then turned ON, the spreader control switch must be manually depressed to the ON position to restart the spinner drive.

Variable Motor Controller Operation



CAUTION

The controller input voltage must be a minimum of 11 volts DC for proper operation. Low voltage may result in an occasional failure to properly sense an over-current condition. Be sure the vehicle battery and alternator are in good operating condition and adequate to provide 11 volts DC to the salt spreader controller.

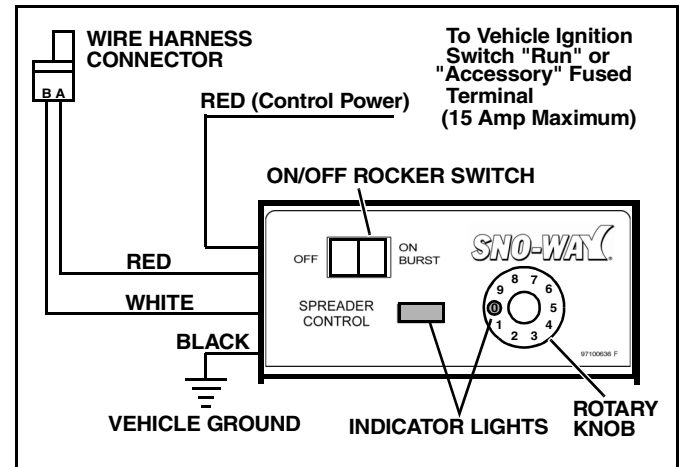


Figure 2-7

The motor controller controls the speed of the spinner drive motor by varying the voltage and current to the spinner drive motor. (See Figure 2-7)

Control current is supplied by a control power lead (RED Wire) from the vehicle fuse block and must be protected by a fuse no greater than 15 amps. This control power lead must also be connected to the fuse block so that the controller receives current **ONLY** when the vehicle ignition is in the ACC position or RUN position.

The spinner drive motor is protected by a 40 amp circuit breaker installed in the wiring system near the vehicle battery.

The spinner drive motor speed is adjusted by a rotary knob on the front of the control box.

The following controls and indicators are located on the face of the control box:

- Green indicator light— Indicates whether spinner motor is on. Light is behind rotary knob.
- On/Off rocker switch—Used to start or stop spinner motor. Also used to activate BURST sequence. Switch is a momentary contact, self centering, rocker type switch.

- Rotary knob—Used to adjust the rotational speed of the spinner motor. Clockwise rotation of the dial will produce a higher rate of speed.
- Red indicator light— Indicates an over-current or over-temperature condition.

Start:

The ON/OFF switch on the front of the control box is a momentary push rocker switch. When the ON side of the switch is depressed, current will be directed to the spinner drive motor and the green indicator light behind the clear dial of the rotary knob will illuminate to indicate that power is ON to the spinner drive motor. Also, when the ON switch is depressed, the motor control will go to FULL output momentarily to provide maximum motor output and speed for initial start-up of the spinner drive motor. After the initial BURST the spinner drive motor speed will go to the speed setting on the rotary knob of the controller.


Power Bursts:

Pressing the ON/OFF switch ON side at any time will activate the POWER BURST (maximum motor speed). As long as the ON side of the switch is depressed the spinner drive motor will continue to run at maximum.

Stall Warnings:

If the spinner drive motor stalls, an over current sensing circuit will cause a warning buzzer to sound for 5 seconds and also cause the red indicator light on the face of the controller to illuminate. The red indicator light will continue to stay lit until the controller is shut off, the cause of the stall is corrected and the controller is re-started.

NOTE: If the spinner drive motor is locked up for more than 5 seconds, the controller will shut down and the red indicator light will continue to stay lit.

 <p>WARNING</p>
<p>Make sure that the vehicle ignition switch is in the OFF position and key removed from the switch before inspecting the Spreader for cause of obstruction.</p> <p>FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.</p>

If the spinner drive motor stalls, press the OFF side of the ON/OFF Switch to shut off the power to the spinner drive motor. Turn off the vehicle ignition and remove the key from the ignition switch. Inspect the hopper and the spinner drive to determine the cause of the obstruction. Correct the problem and test to make sure everything is clear, then restart the spinner drive motor.

Over Temperature Protection:

A temperature sensor in the controller box monitors the temperature of internal components of the controller box. In case of overheating, the sensor will shut down the controller to protect the internal components from heat damage, and the red indicator light will illuminate and the warning buzzer will sound for 5 seconds.

In order to reset the temperature sensor, and the controller, the control box must be allowed to cool down and the ON/OFF switch turned OFF, then ON again.

IMPORTANT: The control box MUST be mounted in the vehicle so that there will be adequate air circulation around the control box to avoid overheating.

Be careful NOT to cover the control box with gloves, jackets, etc. during operation.

DO NOT mount the control box directly to the floor or console of the vehicle.

Grounding Protection For Variable Speed Controller

An adequate ground connection is essential for proper controller function. If the ON/OFF switch is depressed (ON) and the controller is not properly grounded, an audible alarm will sound for approximately 30 seconds, and the indicator light will not come on. If the ground connection is lost for any reason during spreader operation, the spreader will stop and all indicator lights on the controller will go out.

TROUBLESHOOTING GUIDE

Introduction

Whenever service is necessary, your local dealer knows your SNO-WAY® 4 CUBIC FOOT SPREADER best and is interested in your complete satisfaction. Return your SNO-WAY® 4 CUBIC FOOT SPREADER to your local dealer for maintenance service or any other assistance you may require. If you are unable to do so, this Trouble Shooting Guide should help you determine the problem. However, before attempting the servicing of your SNO-WAY® 4 CUBIC FOOT SPREADER, you should possess good mechanical abilities and a total understanding of the mechanism.

PLEASE: Before calling parts and service personnel be certain that:

1. You have read this guide carefully and are certain that all of the suggestions pertaining to your problem have been attempted.
2. You should have the following information available.
 - A. Date SNO-WAY® 4 CUBIC FOOT SPREADER was originally installed.

- B. Spreader Model Number.
- C. Spreader Serial Number.
- D. Controller Serial Number.

This information should be recorded on page 2 of this Owners Manual.

Troubleshooting-Quick Reference General

1. Check to see that vehicle ignition switch is "ON" or in "ACC" position.
2. Check, and replace if necessary, accessory fuse in vehicle fuse panel.
3. Check all wiring to be sure that battery terminals are clean and connections to battery, circuit breaker, switches and all connections on spreader harness and motor are clean and tight.

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Motor does not run.	Material in hopper jamming shaft/chunk busters.	Remove blockage.
	Blown fuse.	Replace fuse.
	Tripped circuit breaker.	Determine cause of electrical overload (such as plugged hopper) and remedy cause. WARNING: Circuit breaker is automatic reset. Turn off controller and vehicle ignition before searching for cause of motor stoppage to prevent motor from starting automatically.
	Loose electrical connections.	Check all connections.
	Motor seized.	Bring motor in for service.
Material will not feed.	No material in hopper.	Fill hopper.
	Material in hopper too wet.	Replace with dry material.
	Material in hopper too coarse.	Replace material.
	Spinner not turning.	Check drive unit. Adjust belt tension. See "Drive Belt Adjustment" on page 16. Check for foreign objects in discharge chute.
Spinner does not turn but motor does turn.	Loose belt.	Adjust belt tension. See "Drive Belt Adjustment" on page 16.
	Hopper plugged stopping spinner.	Replace material.
	Material in hopper too coarse stopping spinner.	Replace material.
	Bearings tight.	Grease bearings and replace if necessary.
Motor starts, but does not continue to run - Control switch does not light. (On-Off controller only.)	Inadequate ground or no ground from controller to vehicle.	1. Make firm contact between ground wire end, grounding screw and metal ground surface in vehicle. 2. Clean and remove any corrosion from ground wire end, ground screw and ground contact surface. 3. Repair damaged or broken ground wire. 4. See dealer.

MAINTENANCE

Polyethylene Hopper Care

- **NEVER** beat on sides of Polyethylene hopper to remove materials, especially at subzero temperatures.
- **DO NOT** use abrasive or highly alkaline cleaners on Polyethylene hopper.
- **NEVER** scrape Polyethylene hopper with squeegees, razor blades or other sharp instruments.
- **Never** use Benzene, Gasoline, Acetone or Carbon Tetrachloride on Polyethylene hopper.
- **DO NOT** clean Polyethylene hopper in hot sun or at elevated temperatures.

Polyethylene Hopper Cleaning Instructions

Wash with a mild soap or detergent and lukewarm water using a clean cloth or soft sponge. Dry outside thoroughly with a chamois or moist cellulose sponge to prevent water spots.

Use of plasticizers such as Armor All® are acceptable to bring out the natural shine of the whole Spreader assembly.

Lubrication Requirements

It is recommended that the two bearings supporting the spinner shaft be lubricated with a lithium base EP marine grade grease at the beginning of **every** operating period.

NOTE: The motor is factory lubricated and sealed and does not require any lubrication.

At the end of the season, check the belt drive idler pulley. Clean the area thoroughly to remove any dirt. Coat all of the exposed surfaces of the bearing and inner bearing sleeve with a good quality grease to protect the bearing and sleeve from corrosion.

Bearings can become bound up with rust if not greased periodically. The spinner shaft should rotate easily. It is recommended that after each use the bearings, especially the bottom bearing, be greased. The grease should come out on the shaft. If it does not, and the bearing does not want to accept grease, the "zerk" fitting is bad and the bearing should be replaced. (See Figure 3-1)

NOTE: Plastic bearings also require lubrication! Apply oil or a spray-on silicone lubricant before each season.

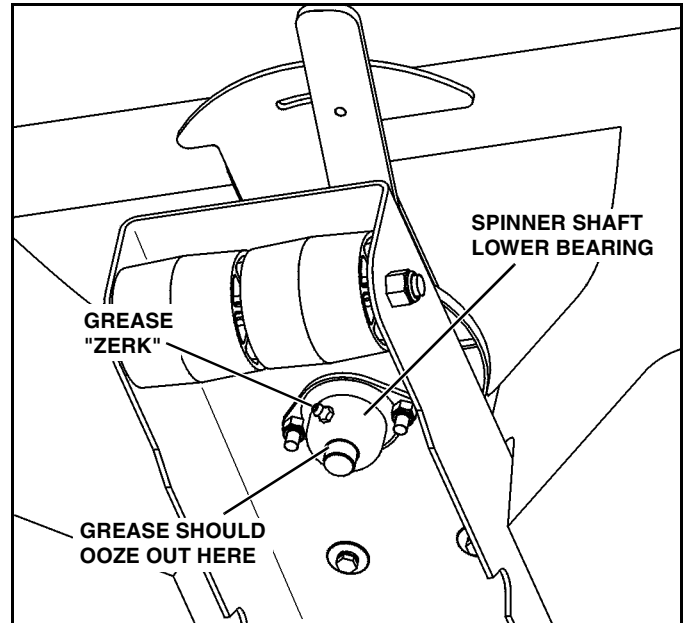


Figure 3-1

Controller Service (On/Off or Variable)

The Variable and On/Off controllers are electronic units that are not serviceable. If the unit does not work after performing tests in the Diagnostics Section, replace the controller.

Motor Service

There are no owner serviceable parts in the motor. The motor is sealed and should not be disassembled for any reason. A brush service kit is listed in the parts section, for installation only by an authorized Sno-Way dealer.

If motor does not work after performing tests in the Diagnostics Section, contact your Sno-Way dealer.

Drive Belt Adjustment

NOTE: Drive belt may be adjusted with the hopper either on or off of the vehicle.

1. Drive vehicle to the desired maintenance area. Set park brake. Turn off engine. Remove key.
2. Disconnect spreader harness from vehicle harness.
3. Remove center cover from hopper by undoing the six stainless steel cap screws that hold down the cover. (See Figure 3-2)

Metri-Pack™ Connector Removal

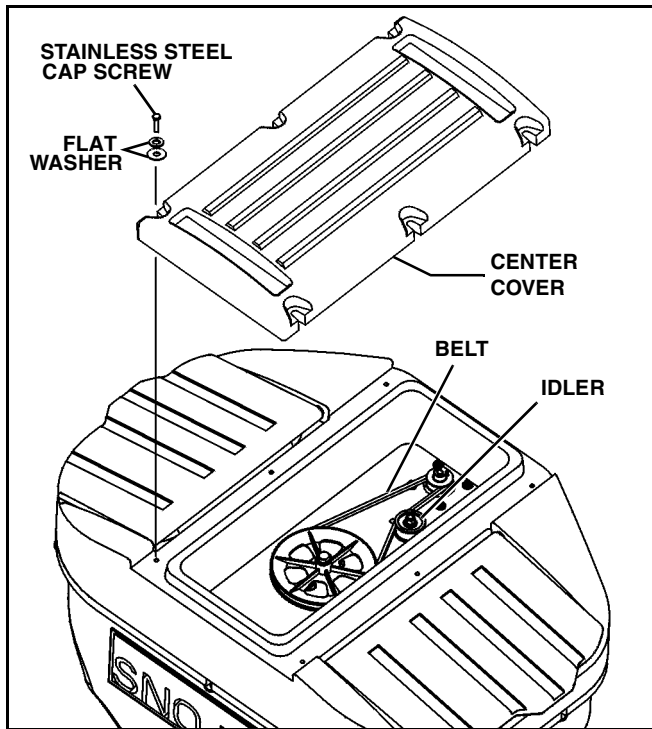


Figure 3-2

4. Loosen cap screw/nut retaining belt tensioner to crossbrace. (See Figure 3-3)

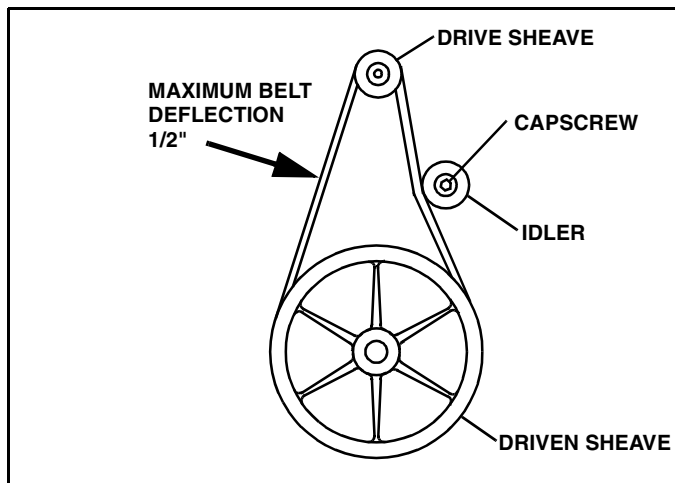


Figure 3-3

5. Adjust idler until belt opposite idler has 1/2 inch deflection. (See Figure 3-3)

6. Tighten cap screw/nut retaining belt tensioner to crossbrace to 23 lbs-ft.

7. Replace center cover and secure the six double-washered bolts.

8. Connect spreader harness to vehicle harness.

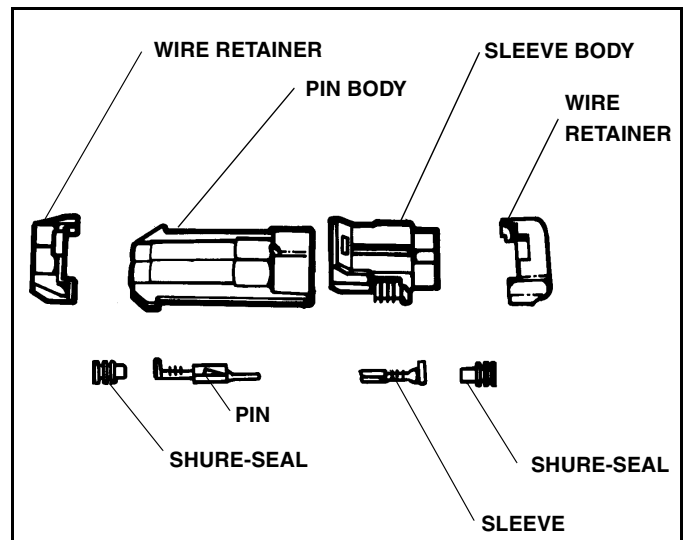


Figure 3-4

IMPORTANT: Identify wire number/color locations with connector terminal letters.

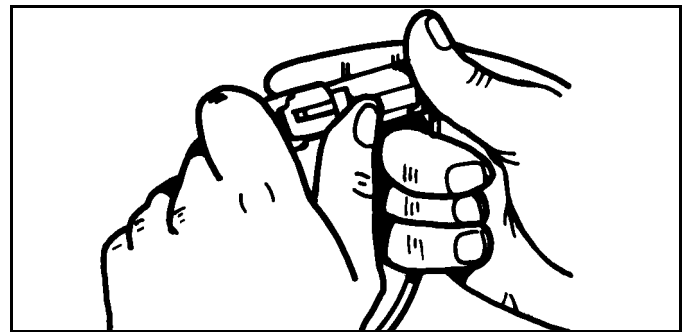


Figure 3-5

1. Open connector body. (See Figure 3-5)

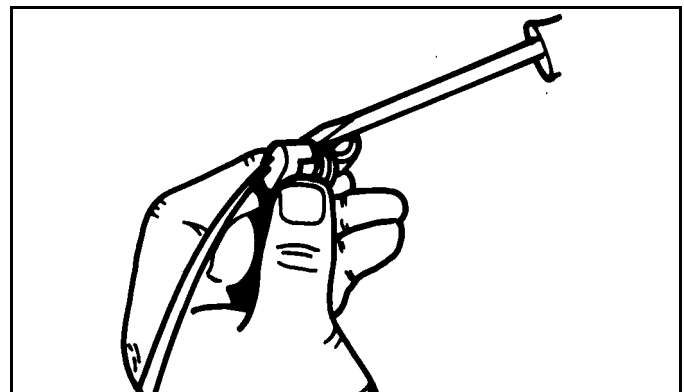


Figure 3-6

2. Remove retainer on wire end of connector with a screwdriver. (See Figure 3-6)

Metri Pack™ Connector Replacement

1. Remove wire from connector body as described above.

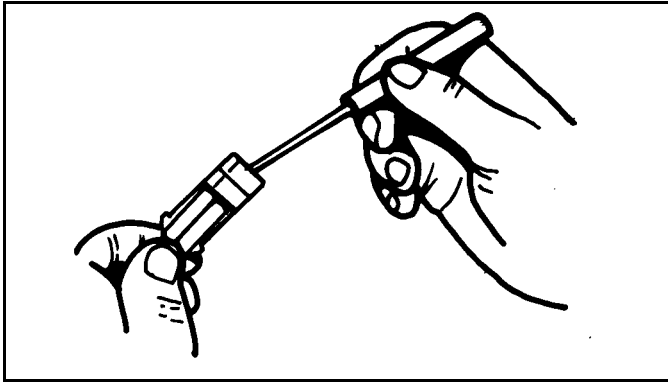


Figure 3-7

3. Use Terminal Removal Tool (#96102499) to remove contact from connector body. (See Figure 3-7)

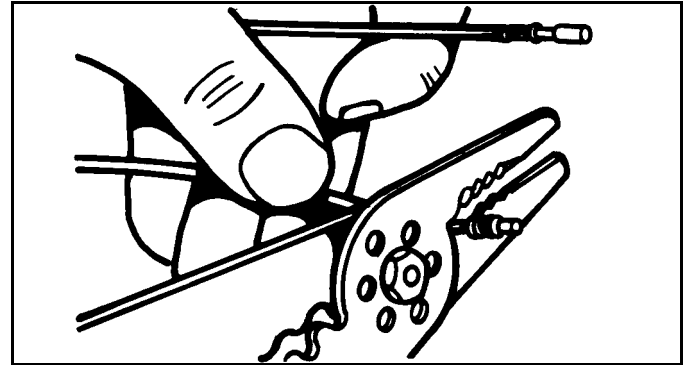


Figure 3-10

2. Use universal electrical pliers to remove wire as close as possible to old contact. (See Figure 3-10)

IMPORTANT: METRI PACK™ connectors are keyed A, B, C, etc. for proper contact mating. Be sure contacts and wire colors/numbers match and are in proper alignment.

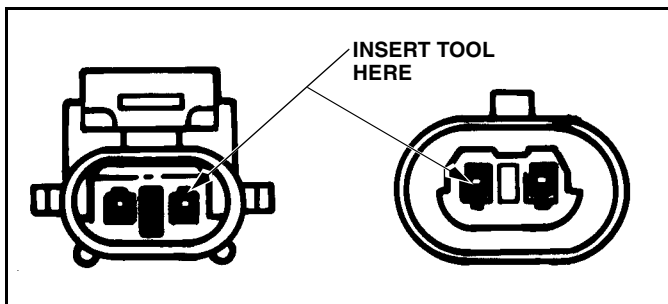


Figure 3-8

NOTE: To remove sleeve connector from sleeve body (short connector half) insert tool in slot between terminal contact and connector body. To remove pin connector from pin body (long connector half) insert tool in center of contact.

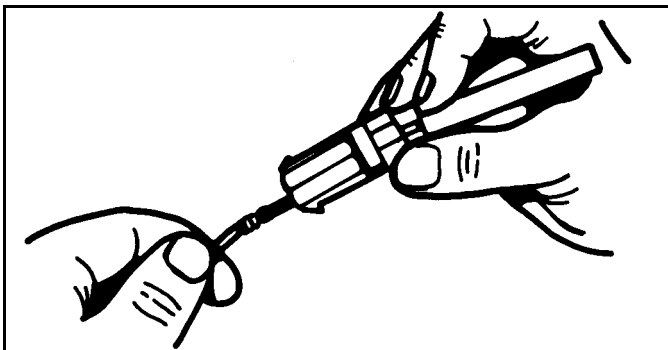


Figure 3-9

4. Hold the removal tool fully seated and pull wire from connector body. (See Figure 3-9)

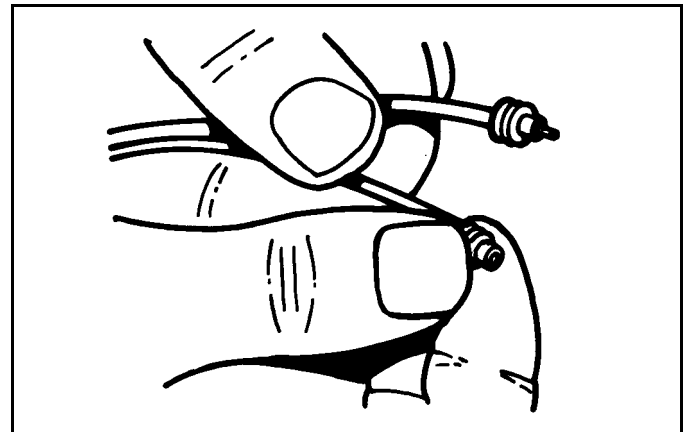


Figure 3-11

3. Install correct size cable seal on wire. (See Figure 3-11)

Cable seals are available for three sizes of wire:

- Large - 1.0 mm (16 gauge) wire
- Medium - 0.8 mm (18 gauge) wire
- Small - 0.5 mm (20 gauge) wire

4. Strip insulation from wire to expose 6mm (1/4 in) and align cable seal with edge of insulation. (See Figure 3-11)

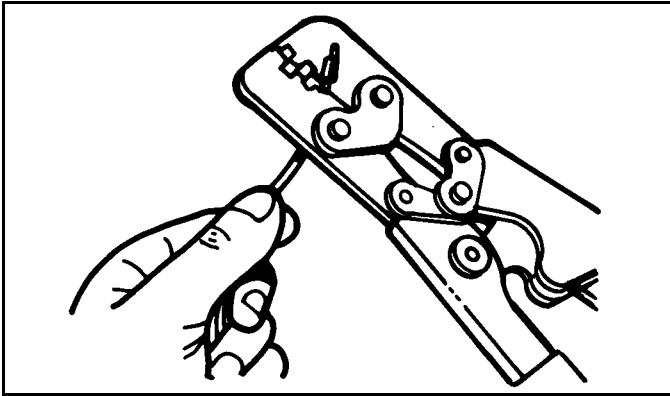


Figure 3-12

5. Place proper size contact on wire and use Crimper (#96102500) to crimp contact in place with a “W” type crimp. (See Figure 3-12)

6. Use Crimper to secure cable seal to contact.

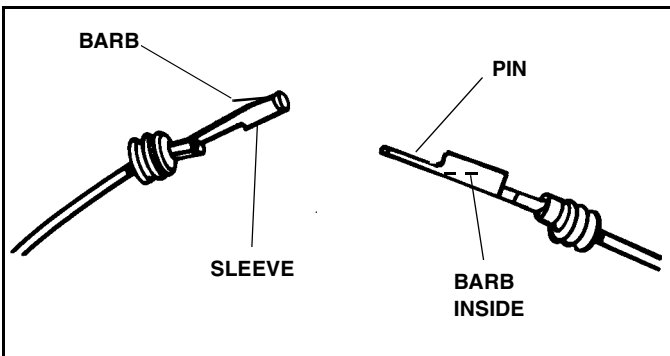


Figure 3-13

IMPORTANT: Proper barb location and orientation for installation of sleeve and pin is shown. (See Figure 3-13)

NOTE: Connector bodies are keyed for proper contact mating. be sure contacts are in proper alignment.

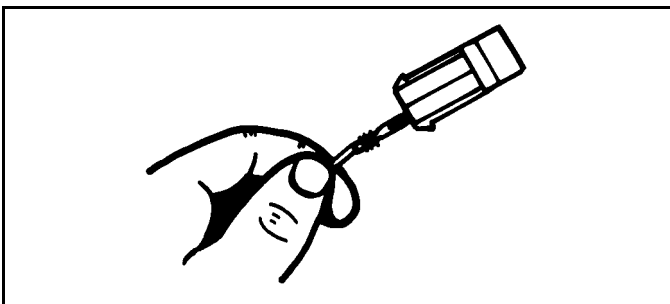


Figure 3-14

7. Push contact into new connector body until fully seated. (See Figure 3-14)

8. Pull on wire slightly to be certain terminal is locked in place.

9. Install wire retainer. Transfer remaining wires to correct terminal in new connector.

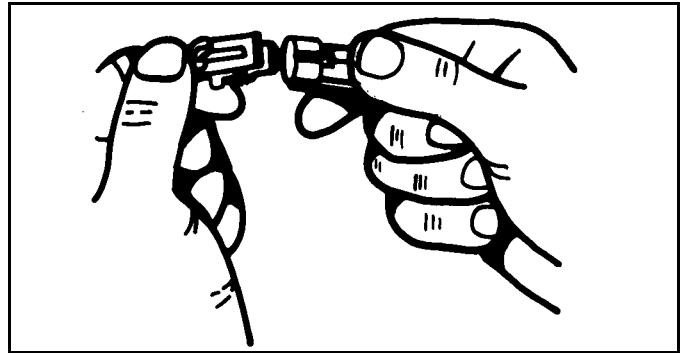


Figure 3-15







10. Place retainer on wire end of connector and snap in place.

11. Close connector body.

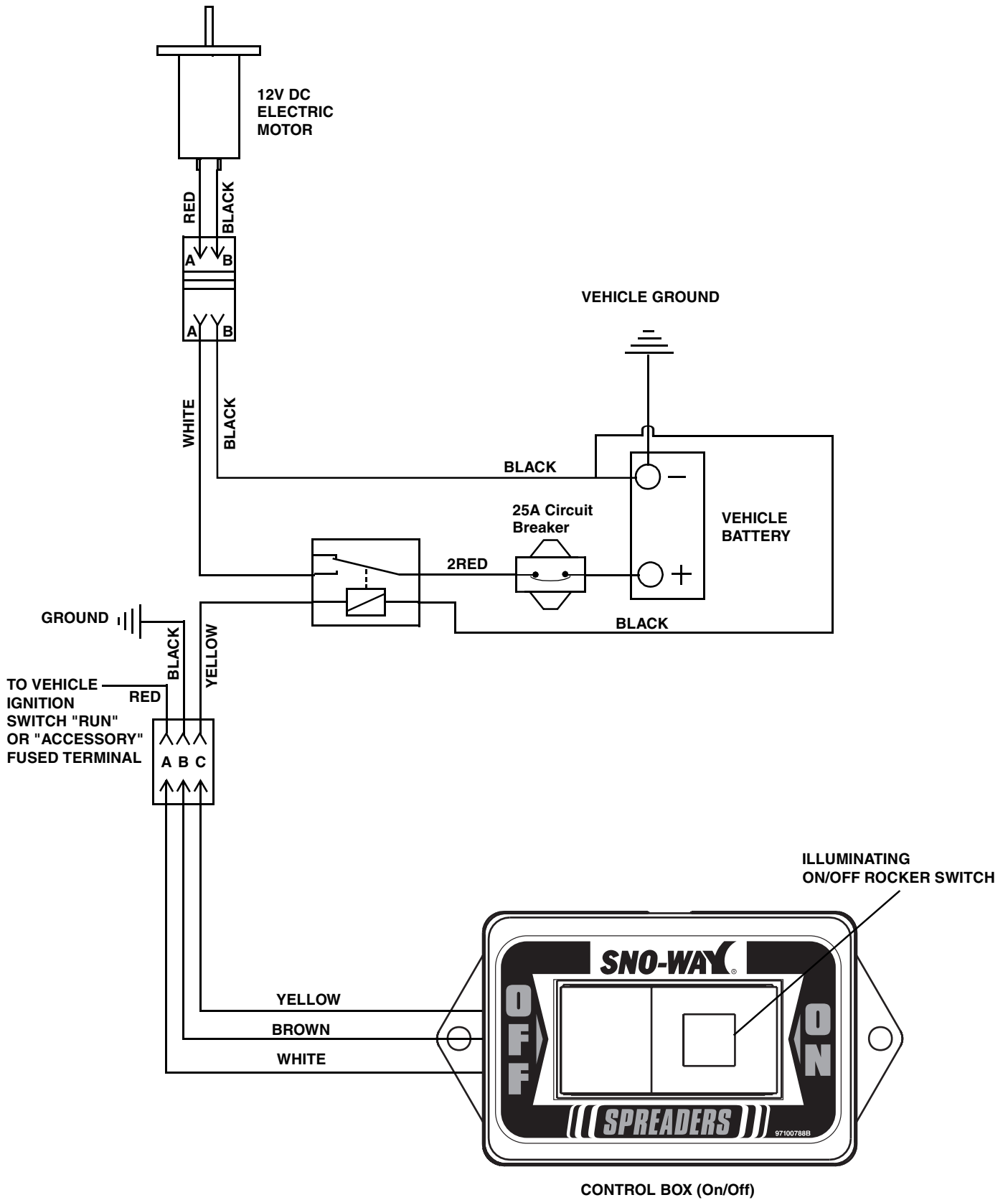
TORQUE SPECIFICATIONS

NOTE: Use these torque values when tightening Sno-Way hardware (excluding: Locknuts and Self-tapping, thread Forming and Sheet Metal Screws) unless specified otherwise.

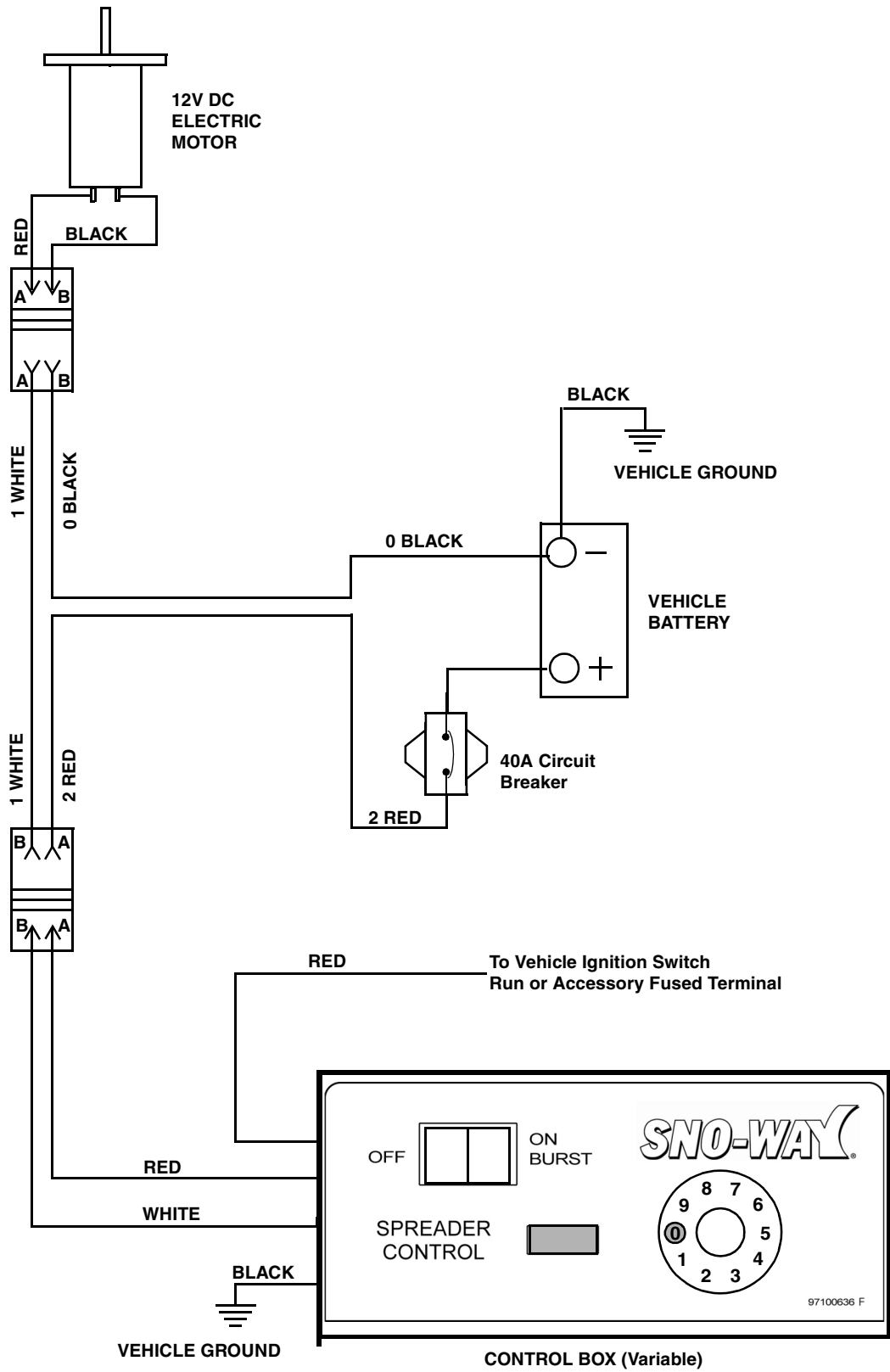
All torque values are in Lb-Ft except those marked with an * which are Lb-In
(For metric torque value Nm, multiply Lb-Ft value by 1.355 or Lb-In value by 0.113)

Unified National Thread	Grade 2		Grade 5		Grade 8	
	Dry	Lubed	Dry	Lubed	Dry	Lubed
8-32	19*	14*	30*	22*	41*	31*
8-36	20*	15*	31*	23*	43*	32*
10-24	27*	21*	43*	32*	60*	45*
10-32	31*	23*	49*	36*	68*	51*
1/4-20	66*	50*	9	75*	12	9
1/4-28	76*	56*	10	86*	14	10
5/16-18	11	9	17	13	25	18
5/16-24	12		19	14		20
3/8-16	20	15	30	23	45	35
3/8-24	23	17	35	25	50	
7/16-14	32	24	50	35	70	55
7/16-20	36	27	55	40	80	60
1/2-13	50	35	75	55	110	80
1/2-20	55	40	90	65	120	90
9/16-12	70	55	110	80	150	110
9/16-18	80	60	120	90	170	130
5/8-11	100	75	150	110	220	170
5/8-18	110	85	180	130	240	180
3/4-10	175	130	260	200	380	280
3/4-16	200	150	300	220	420	320
7/8-9	170	125	430	320	600	460
7/8-14	180	140	470	360	660	500
1-8	250	190	640	480	900	680
1-14	270	210	710	530	1000	740
Metric Course Thread	Grade 8.8		Grade 10.9		Grade 12.9	
	Dry	Lubed	Dry	Lubed	Dry	Lubed
M6-1	8	6	11	8	13.5	10
M8-1.25	19	14	27	20	32.5	24
M10-1.5	37.5	28	53	39	64	47
M12-1.75	65	48	91.5	67.5	111.5	82
M14-2	103.5	76.5	145.5	108	176.5	131
M16-2	158.5	117.5	223.5	165.5	271	200

WIRING SCHEMATIC (ON/OFF CONTROL)



WIRING SCHEMATIC (VARIABLE CONTROL)



PARTS LIST INTRODUCTION

Our dealership network stands by to provide you with any assistance you may require, including genuine Sno-Way service parts. All parts should be obtained from or ordered through your dealer. Give complete information about the part as well as the Model Number and Serial Number of your machine.

Record the Serial Number in the space provided in your Owner's Manual for quick reference. The Serial Number for the unit is on a plate located on the left frame gusset of the Hopper Frame.

"Right" and "Left" are determined from a position sitting on the Operators Seat of the vehicle.

We reserve the right to make changes or improvements in the design or construction of any part without incurring the obligation to install such changes in any unit previously delivered.

USING THIS PARTS LIST

Below is parts listing with four columns. The first column is the "ITEM", the second is the "PART NUMBER", The third is the "DESCRIPTION" and the fourth is the "QUANTITY".

The **"ITEM"** is the number used in the corresponding illustration.

The **"PART NO."** Is the number used to order replacement parts. If a number does not appear in the column the part is only available by ordering the complete assembly.

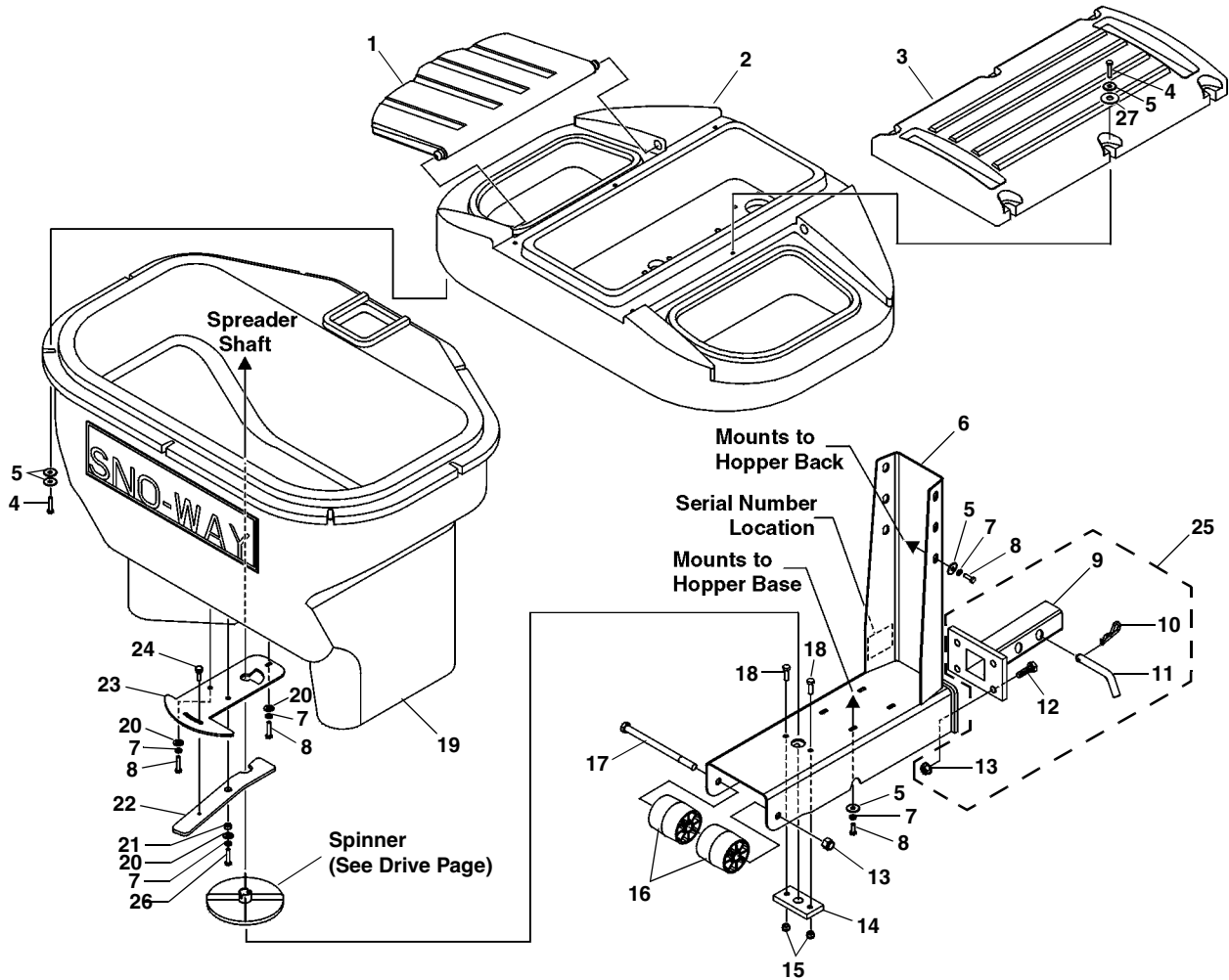
The **"DESCRIPTION"** is the name of the replacement part. At times the name may be indented, this means that the indented parts are part of the preceding assembly.

The **"QTY."** Is the quantity needed to service the assembly illustrated, not the complete product.

ITEM	PART NO.	DESCRIPTION	QTY.
------	----------	-------------	------

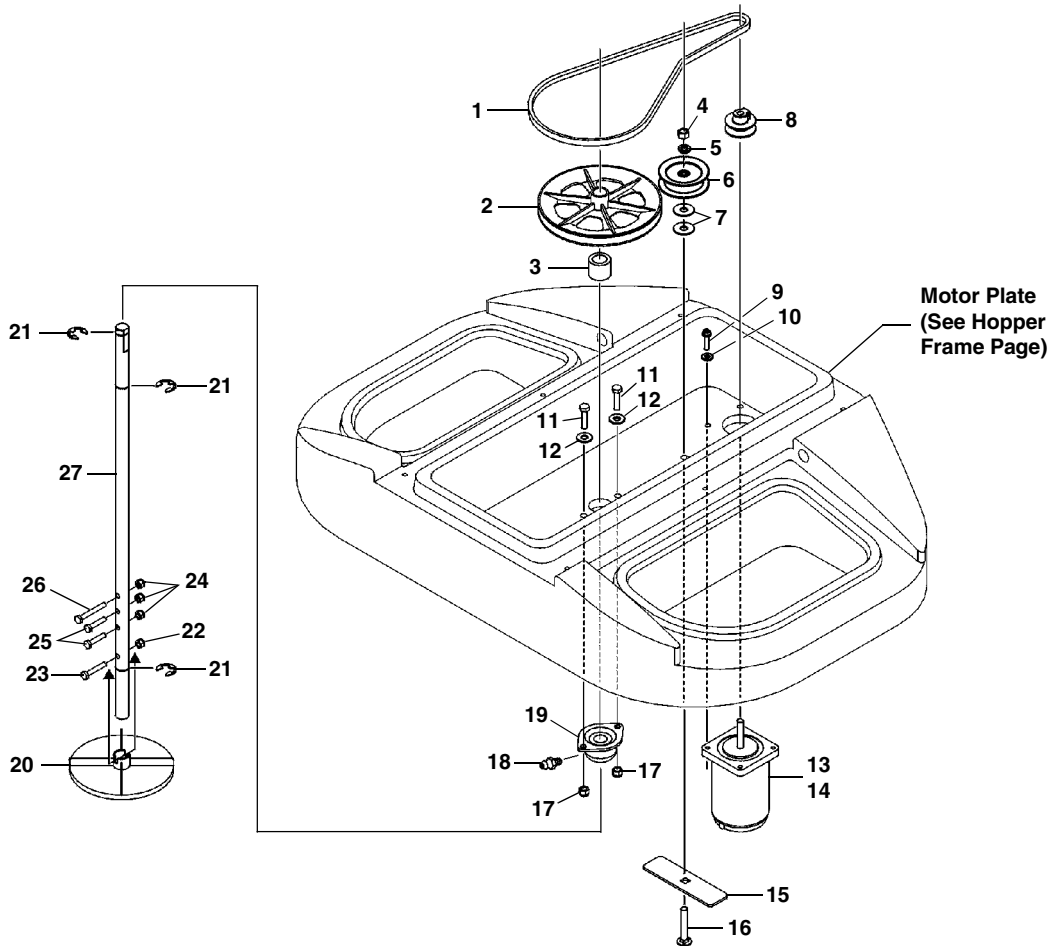
ITEM	PART NO.	DESCRIPTION	QTY.
1	96100083	O-ring	1
2	96001529	Elbow	3
3	98100036	Capscrew, Hex.,3/8"-16NC x 7/8"	9

HOPPER FRAME



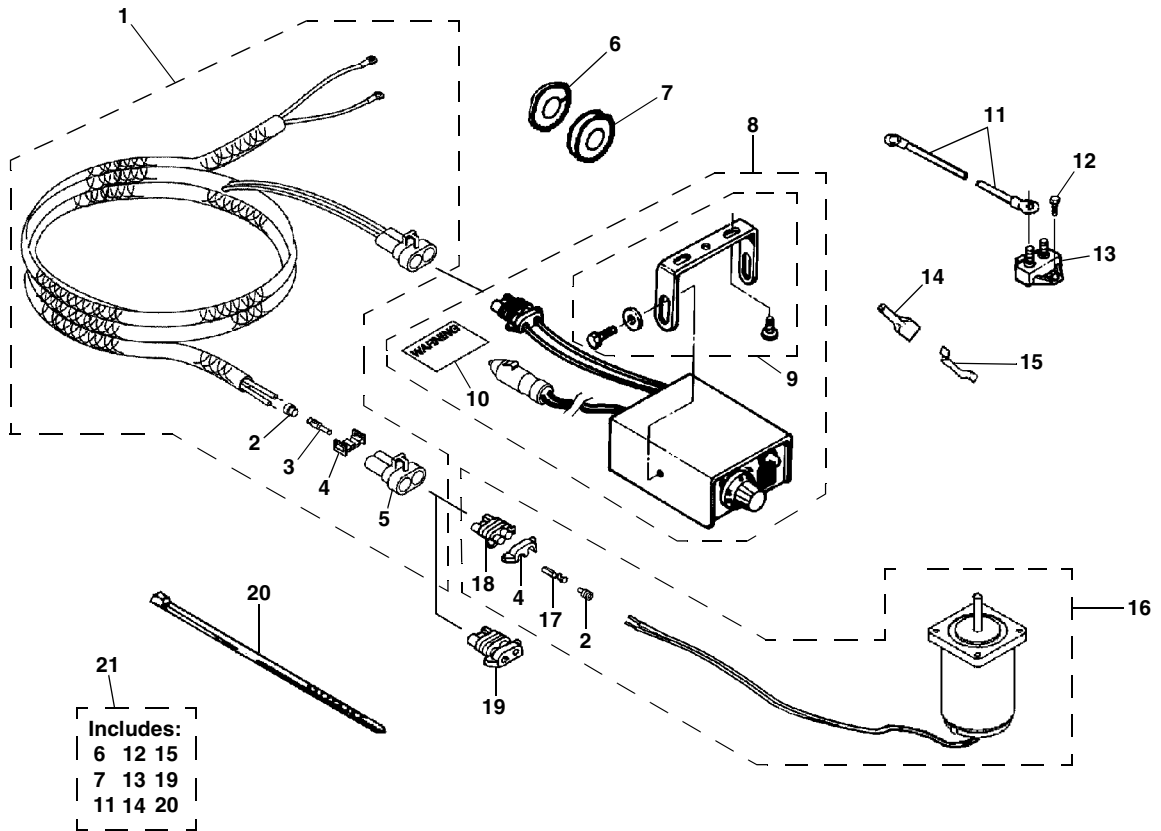
ITEM	PART NO.	DESCRIPTION	QTY.
1	96107249	Lid, Flip.....	2
2	96107309	Platform, Motor.....	1
3	96107310	Cover, Motor.....	1
4	98100335	Capscrew, Hex Head, 1/4"-20 x 1-1/4", SS.....	13
5	98100333	Washer, Flat, 1"O.D. x .281 x 0.50, SS.....	30
6	96107165	Frame, Spreader.....	1
7	98009226	Washer, Lock, 1/4", SS.....	13
8	98100344	Cap Screw, Hex Head, 1/4"-20 x 1/2", SS.....	12
9	96105830	Hitch Tube Assy.....	1
10	98009004	Pin, Spring.....	1
11	98100317	Pin, Bent Arm, 5/8" x 3" Hole.....	1
12	98100095	Bolt, 1/2"-13 x 1-3/4", Grade 8.....	4
13	98100349	Nut, Nylock, 1/2"- 13, SS.....	5
14	96108409	Bearing, Plastic.....	1
15	98100118	Nut, Nylock, 5/16"-18, SS.....	2
16	96107680	Roller, Plastic.....	2
17	98100348	Cap Screw, Hex Head, 1/2"-13 x 7-1/2", SS.....	1
18	98100131	Cap Screw, Hex Head, 5/16"-18 x 1", SS.....	2
19	96107245	Hopper.....	1
20	98100122	Washer, Flat, 1/4", SS.....	3
21	96107763	Spacer, Valve Plate.....	1
22	96107736	Plate, Flow Control.....	1
23	96107735	Plate, Flow Gate.....	1
24	96106458	Thumb Screw, Nylon, 1/4"-20 x 3/4".....	1
25	96105863	Assembly, Hitch Adaptor.....	1
26	98100343	Cap Screw, Hex Head, 1/4'-20 x 7/8", SS.....	1
27	98100347	Washer, Flat, 1-1/4" O.D. x .531 x .062. SS.....	6

DRIVE



ITEM	PART NO.	DESCRIPTION	QTY.
1	96107237	V-Belt, 37" O.C.	1
2	96107072	Sheave, V-Belt, 7" O.D.	1
3	96107183	Spacer, Spreader Shaft	1
4	98100120	Nut, Hex, 3/8"-16, SS	1
5	98100125	Washer, Lock, 3/8", SS	1
6	96108572	Pulley, 4" Idler	1
7	98100350	Washer, Flat, 3/8", 13/32" I.D., 1-1/2" O.D. ZD	2
8	96107363	Sheave, V-Belt, 1-3/4" O.D.	1
9	98100139	Cap Screw, 1/4"-20 x 1", Type F	4
10	98009029	Washer, Flat, 1/4", Type A, Narrow	4
11	98100111	Cap Screw, Hex Head, 5/16"-18 x 1-1/4", SS	2
12	98100123	Washer, Flat, 5/16", SS	2
13	96107181	Motor, 0.15 HP, 12VDC	1
14	96105922	Brush End Cap (Brush service kit for 96107181 motor)	1
15	96107362	Plate, Tensioner Support	1
16	98100128	Bolt, Carriage, 3/8"-16 x 2-1/4", SS	1
17	98100118	Nut, Nylock, 5/16"-18, SS	2
18	96108630	Kit, Zerk (2 Zerks in kit)	1
19	96107287	Bearing, Flange Mount	1
20	96107079	Spinner, 6 Inch	1
21	98100312	E-Ring, 3/4"	3
22	98100336	Nut, Nylock, 1/4"-20, SS	1
23	98100127	Cap Screw, Hex Head, 1/4"-20 x 1-1/2", SS	1
24	98100255	Nut, Nylock, 1/4"-20	3
25	98100253	Cap Screw, Hex Head, 1/4"-20 x 1-1/4"	2
26	98100299	Cap Screw, Hex Head, 1/4"-20 x 2"	1
27	96107071	Shaft, Spreader (no hardware)	1

ELECTRICAL (VARIABLE CONTROL)

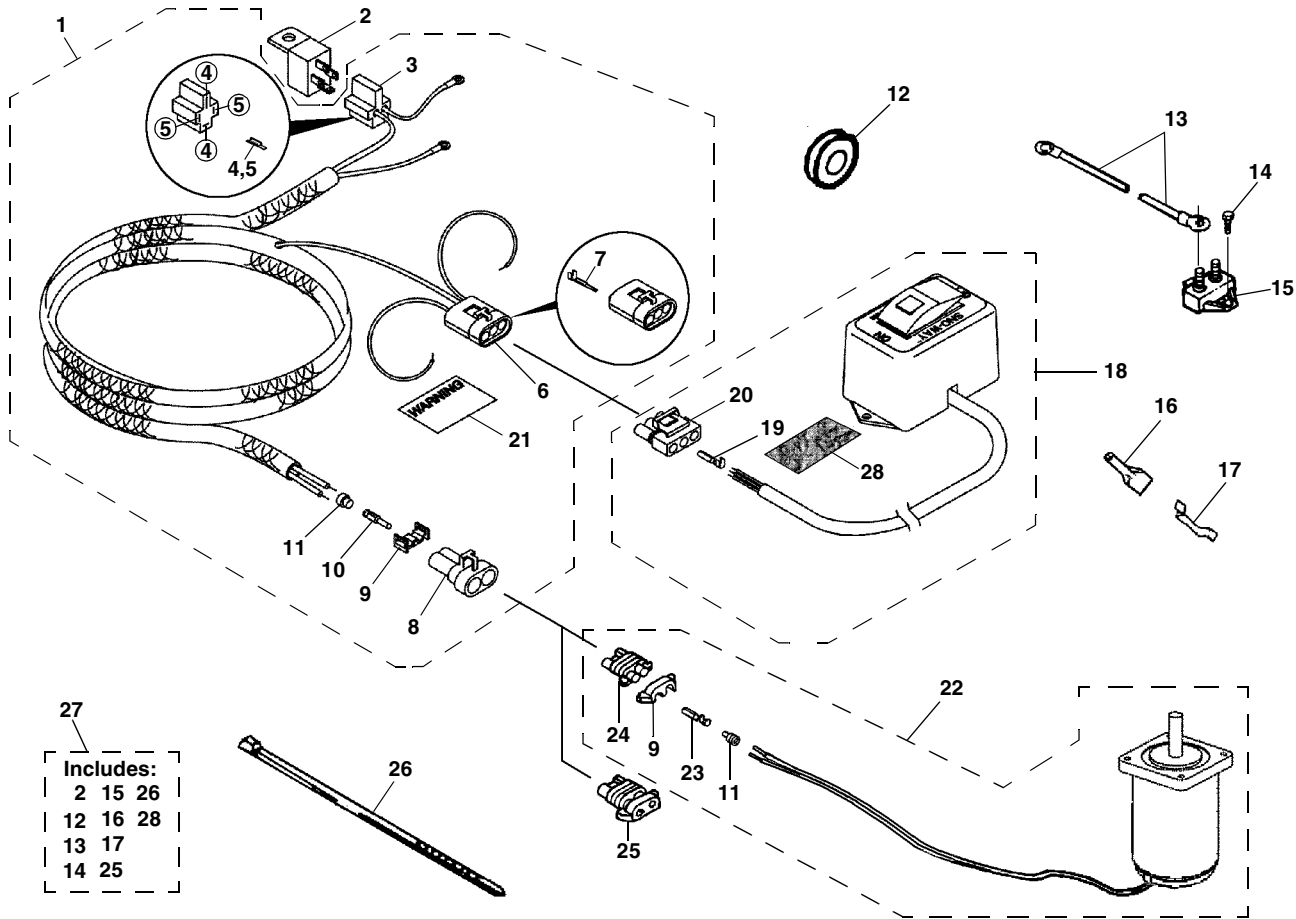


Includes:
6 12 15
7 13 19
11 14 20

ITEM	PART NO.	DESCRIPTION	QTY
1	96102293	Harness, Variable Control	1
2	96102443	Seal	8
3	96102442	Terminal, Male	4
4	96102418	Lock, Secondary	4
5	96102441	Connector, Male	2
6	96101846	Seal, Neoprene	1
7	96002077	Grommet, 3/4"	1
8	96104104	Controller, Variable (Controller SN 010175 & later shown, SEE NOTE)	1
9	96104101	Mounting Bracket	1
10	97100034	Decal, Warning (Controller SN up to 010174)	1
	97100996	Decal, Warning (Controller SN 010175 & later)	1
11	96102362	Wire, Power	1
12	98100037	Screw, Self Tapping #10 x 1"	2
13	96102344	Breaker, Circuit, 40A	1
14	96002085	Terminal, 1/4", Female Push-On	1
	96101845	Connector, Female	1
15	96002083	Tap, 1/4", ATC/ATO Fuse	1
	96101832	Tap, 1/4", Mini Fuse	1
16	96107181	Motor, 0.15 HP, 12VDC	1
17	96102347	Terminal, Female	4
18	96102346	Connector, Female	2
19	96102417	Cap, Storage	1
20	96001227	Tie, Cable	5
21	96102310	Bag of Parts (Variable Control)	1

NOTE: Variable Controllers with serial numbers before 010175 were not equipped with disconnect protection or cigarette lighter adapter power connection. Variable Controllers with these improvements are backwards compatible and can be purchased as service replacements for older controllers.

ELECTRICAL (ON/OFF CONTROL)



ITEM	PART NO.	DESCRIPTION	QTY
1	96105890	Harness, On/Off Control	1
2	96105891	Relay, 70A	1
3	96105946	Connector, Harness Relay	1
4	96105947	Terminal, Female, 10-12 AWG, Relay	2
5	96105948	Terminal, Female, 12-16 AWG, Relay	2
6	96105940	Connector, Male	1
7	96105942	Terminal, Male Pin	3
8	96102441	Connector, Male	1
9	96102418	Lock, Secondary	2
10	96102442	Terminal, Male	2
11	96102443	Seal, Cable	4
12	96104893	Grommet, 1/2" I.D.	1
13	96102362	Wire, Power	1
14	98100037	Screw, Self Tapping #10 x 1"	2
15	96105893	Breaker, Circuit, 25A	1
16	96002085	Terminal, 1/4", Female Push-On	1
	96101845	Connector, Female	1
17	96002083	Tap, 1/4", ATC/ATO Fuse	1
	96101832	Tap, 1/4", Mini Fuse	1
18	96105793	Controller, On/Off	1
19	96105943	Terminal, Female	2
20	96105941	Connector, Female	1
21	97100034	Decal, Warning	1
22	96107181	Motor, 0.15 HP, 12VDC	1
23	96102347	Terminal, Female	2
24	96102346	Connector, Female	1
25	96102417	Cap, Storage	1
26	96001227	Tie, Cable	5
27	96105908	Bag of Parts (On/Off Control)	1
28	96105945	Strip, Hook and Loop Fastener	1

WIRE HARNESS INSTALLATION

Introduction

The information contained in this section will instruct you on the proper installation and set up of the wire harness.

REMEMBER After the Spreader is installed on the vehicle, the Pre-Delivery Check List and Delivery Check List must be completed.

TOOL LIST

Safety Goggles	Drill
Wire Crimp Tool	Drill Bit 3/8" (ON/OFF Control)
Utility Knife	Hole Saw 1-3/8" (Variable Control)
12 Volt Test Light	

Wire Harness Installation

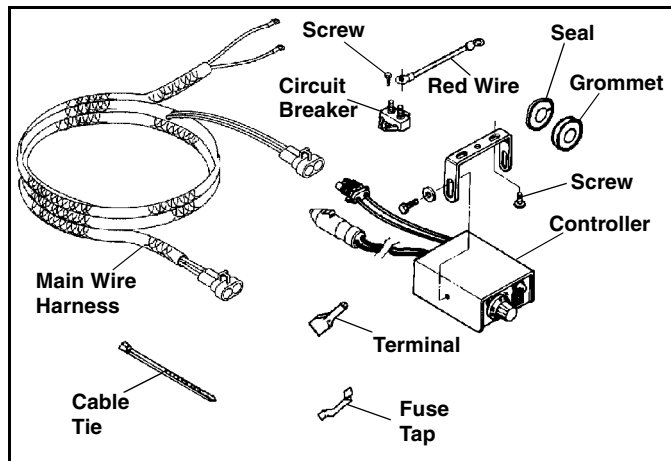


Figure 4-1, (Variable Control)

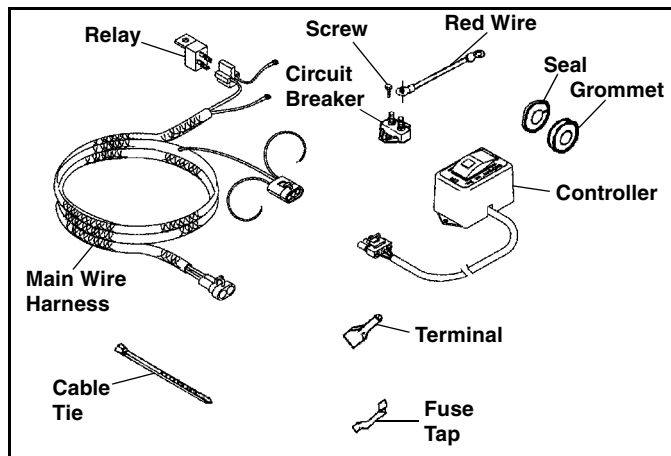


Figure 4-2, (On/Off Control)

1. Locate the following parts:

- Controller
- Wire Harness, Main
- Circuit Breaker
- Fuse Tap
- Terminal, Female
- Grommet
- Neoprene Seal
- Red Wire, Short
- Cable Tie, Plastic
- Self Tapping Screw
- Mounting Bracket (In variable controller carton)
- Relay, 70A (On/Off control only)

(For reference to part numbers, see service parts listing "Electrical" on pages 26- 27.)

NOTE: Take the extra time needed to plan the routing of the wiring harness before drilling any holes or fastening the harness or control box in place. Read all the instructions carefully to ensure all the required conditions are met for a safe and professional installation.

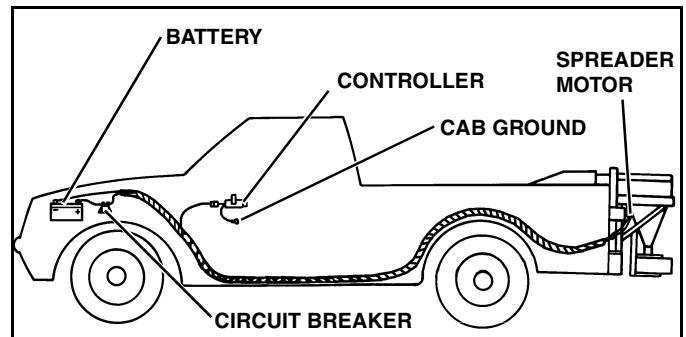


Figure 4-3

2. Uncoil the wiring harness and route the end of the harness with the short red and black wires - with ring terminals installed- from under the vehicle up into the engine compartment on the battery side.

3. Position the red and black wires (with terminals) near the battery and prepare to route the five foot section, with connector, into the vehicle operator compartment area.

NOTE: The relay for the variable speed control is located inside the control module in the cab of the vehicle and requires a 1-3/8" hole for route the power lead terminal into the cab. The relay for the ON/OFF control is located in the engine area and only requires a 3/8" hole for routing the smaller power lead terminal into the cab.

4. Look for an existing hole, with rubber grommet, in the vehicle firewall. The hole must be 3/8" or larger for ON/OFF control or 1-3/8" or larger for variable control.



CAUTION

DO NOT drill any holes until a thorough visual inspection is performed to determine that the area around the hole to be drilled, on both sides of the firewall, is clear of any obstacles such as brake lines, linkage or vehicle wiring.

5. If an existing hole of the correct size is not available, look for an area to drill the hole that satisfies these conditions;

- Hole should be drilled on the same side of the vehicle firewall (left or right) as the vehicle battery.
- DO NOT put a hole in such a spot that will force the wiring harness, when installed, to interfere or be routed behind accelerator pedal, brake pedal, clutch pedal, parking brake or associated linkage.
- DO NOT drill any holes until a thorough visual inspection is performed to determine that the area around the hole to be drilled, on both sides of the firewall, is clear of any obstacles such as brake lines, linkage or vehicle wiring.

NOTE: If the hole has to be drilled through carpeting or insulation, reverse the direction of the drill until the carpet has been penetrated, remove the carpet from the hole saw then use the forward direction to continue drilling through the firewall, this should prevent "running" in the carpet.

6. Using a twist drill or hole saw, as necessary, drill a hole through the vehicle firewall of the correct size for the control unit being installed.



CAUTION

Keep wiring harness away from moving parts, sharp edges and areas of extreme heat to avoid electrical failure and fire.

7. Insert wiring harness through rubber grommet and firewall, then install grommet into firewall.



WARNING

Disconnect vehicle NEG. (-) battery cable while performing Steps 8 - 19 to avoid serious bodily injury from fire or explosion.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

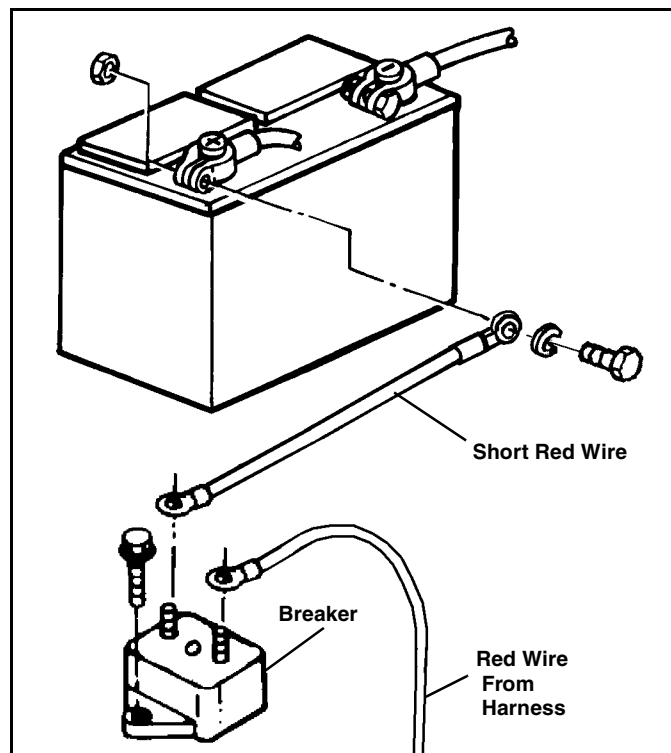


Figure 4-4

8. Locate short red wire (#96102362) with two ring terminals. Attach the small ring terminal to the copper colored post marked BAT on the breaker. Attach the other, large ring terminal to the battery positive terminal. (See Figure 4-4)

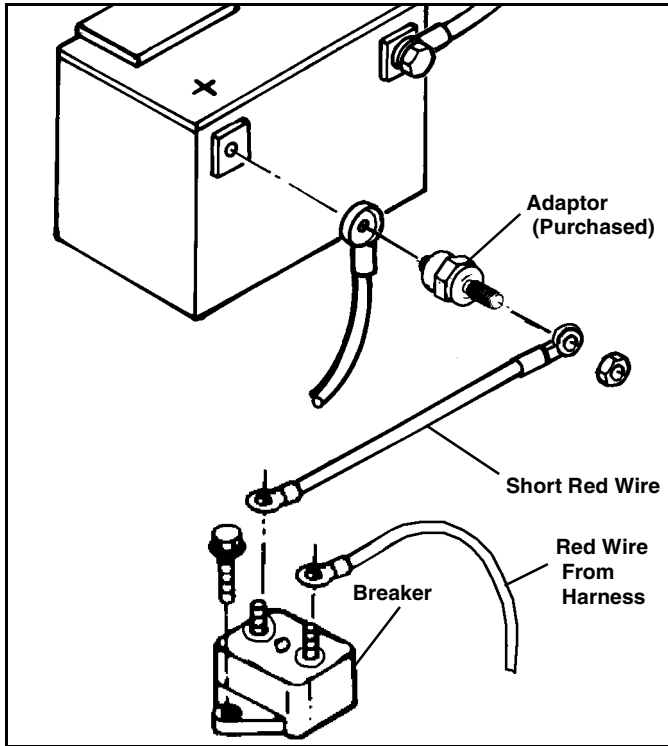


Figure 4-5

NOTE: If the vehicle has a "side post" battery, it will be necessary to install adaptors (#96100773) to make connections at the vehicle battery. (See Figure 4-5)

IMPORTANT: The circuit breaker must be placed in a location that will avoid excessive heat. DO NOT locate these parts near the engine exhaust manifold. A preferred location is one that will receive good air flow from the radiator fan, but be protected from excessive engine heat.

9a. Mount the circuit breaker with two (2) #10 x 1" self-tapping screws (#98100037).

9b. For On/Off control only, assemble the relay (from the bag of parts) onto the relay connector plug on the main wire harness. Mount the relay, using the mounting tab on the relay and a #10 x 1" self-tapping screw (#98100037) near the circuit breaker in a location that will avoid excessive heat.

10. Attach the ring terminal of the positive (RED) wire of the wiring harness to the other terminal of the circuit breaker.

11. Attach the black harness negative wire to the vehicle battery NEG (-) post.



WARNING

Mount the control box in an area that will not interfere with the legs during seat travel and that will not allow the knees to come in contact with it in an accident.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

12a. Mount the control box mounting bracket (variable control) to the center drive tunnel or vehicle dash with #10-16 x 1" self-drilling screws provided. Assemble the controller to the bracket with screws and washers provided.

12b. For On/Off control only, use hook and loop strips (Velcro®) to mount the control in an appropriate location.

13. Connect the vehicle harness, inside the cab, to the control box connector.

14. Remove the accessory fuse from the vehicle fuse box.

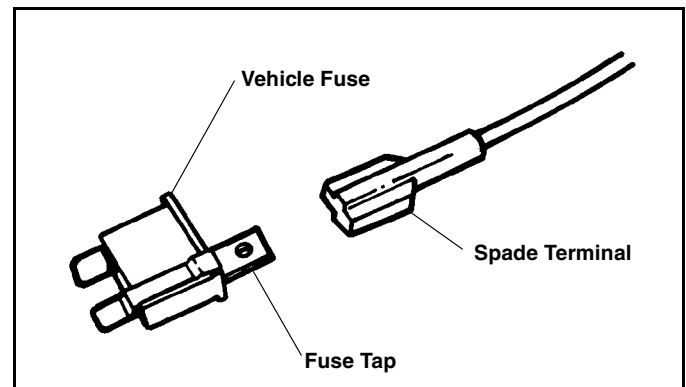


Figure 4-6

15. Using a test probe, determine the fused "Dead/OFF" side of the fuse and attach the A.T.O. fuse tap to that side of the fuse. (See Figure 4-6)

NOTE: Two fuse tap-ins are provided, one for standard (ATO/ATC) automotive blade fuses and one for mini-blade automotive fuses. Determine which type of fuse the vehicle uses. If the standard fuse is used, the fuse tap-in will require the provided 1/4" female spade terminal, if the mini-fuse is used, the fuse tap-in will require the provided 3/16" female spade terminal.

IMPORTANT: DO NOT use fuse designated for head lamp, tail lamp, stop lights, panel lights, or other critical fuses.

NOTE: If accessory fuse is not available in the fuse box use another fuse with a 10-15 amp designation, i.e. radio, lighter, etc.

16. Cut end of wire to length, strip end and install the appropriate female spade terminal onto wire.

17. Attach female spade terminal to appropriate fuse tap-in and re-install fuse.

IMPORTANT: The RED wire must be protected by a fuse. If it is not practical to attach this wire to a fused circuit in the vehicle fuse box an in line 10 amp fuse must be added to this wire.

18a. The variable control unit requires proper grounding for operation. If the ground is not maintained sufficiently the unit may fail prematurely. Very often chassis grounds are insufficient to maintain the proper ground required for the variable control. Directly route the ground wire from the variable control unit to the battery negative (-) terminal. (See Figure 4-7)

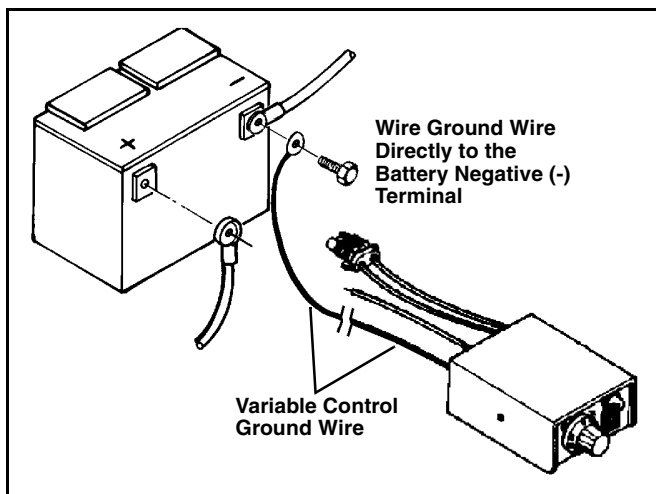


Figure 4-7

18b. For the in-cab-power-supplied Variable Speed Control, first plug in the main power lead harness to the control and then plug in the cigarette lighter lead into a power supply (cigarette lighter receptacle) in the vehicle. When the spreader control is not in use, unplug the cigarette lighter lead from the power supply. (See Figure 4-8)

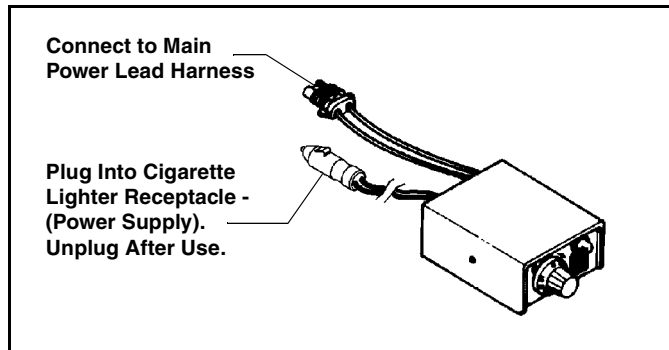


Figure 4-8



CAUTION

Keep wiring harness away from moving parts, sharp edges and areas of extreme heat to avoid electrical failure and fire.

19. Route vehicle harness from engine compartment to rear bumper by the hitch receiver tube. Attach the harness assembly to the vehicle at different points in the cab and engine compartment and frame that will not allow the harness to come in contact with sharp edges, hot components and moving parts or mechanisms. Be sure the harness is supported and protected by the vehicle frame.

20. Fasten the main wire harness to the hitch assembly of the vehicle near the hitch receiver tube. Fasten the harness so that the connector will be protected from damage when the spreader is not installed.

21. Connect the motor wire harness to the main wire harness.

22. Secure motor wire harness to hopper frame with a plastic cable tie.

23. Make sure that there is no binding of the wire harness around frame and bumper.

NUMERICAL INDEX

PART NO.	PAGE	ITEM	PART NO.	PAGE	ITEM	PART NO.	PAGE	ITEM
96001227	26	20	96107079	25	20	98100349	24	13
	27	26	96107165	24	6	98100350	25	7
96002077	26	7	96107181	25	13			
96002083	26	15		26	16			
	27	17		27	22			
96002085	26	14	96107183	25	3			
	27	16	96107237	25	1			
96101832	26	15	96107245	24	19			
	27	17	96107249	24	1			
96101845	26	14	96107287	25	19			
	27	16	96107309	24	2			
96101846	26	6	96107310	24	3			
96102293	26	1	96107362	25	15			
96102310	26	21	96107363	25	8			
96102344	26	13	96107680	24	16			
96102346	26	18	96107735	24	23			
	27	24	96107736	24	22			
96102347	26	17	96107763	24	21			
	27	23	96108409	24	14			
96102362	26	11	96108572	25	6			
	27	13	96108630	25	18			
96102417	26	19	97100034	26	10			
	27	25		27	21			
96102418	26	4	97100996	26	10			
	27	9	98009004	24	10			
96102441	26	5	98009029	25	10			
	27	8	98009226	24	7			
96102442	26	3	98100037	26	12			
	27	10		27	14			
96102443	26	2	98100095	24	12			
	27	11	98100111	25	11			
96104101	26	9	98100118	24	15			
96104104	26	8		25	17			
96104893	27	12	98100120	25	4			
96105793	27	18	98100122	24	20			
96105830	24	9	98100123	25	12			
96105863	24	25	98100125	25	5			
96105890	27	1	98100127	25	23			
96105891	27	2	98100128	25	16			
96105893	27	15	98100131	24	18			
96105908	27	27	98100139	25	9			
96105922	25	14	98100253	25	25			
96105940	27	6	98100255	25	24			
96105941	27	20	98100299	25	26			
96105942	27	7	98100312	25	21			
96105943	27	19	98100317	24	11			
96105945	27	28	98100333	24	5			
96105946	27	3	98100335	24	4			
96105947	27	4	98100336	25	22			
96105948	27	5	98100343	24	26			
96106458	24	24	98100344	24	8			
96107071	25	27	98100347	24	27			
96107072	25	2	98100348	24	17			

SNO-WAY® INTERNATIONAL, INC.

SNO-WAY®
SNOW & ICE CONTROL EQUIPMENT

Hartford, WI 53027 USA
Website: www.snoway.com
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DEALER PRE-DELIVERY CHECKLIST

The following inspections **MUST** be accomplished prior to delivering the SNO-WAY® 4 CUBIC FOOT SPREADER to the customer. Place an X ☒ in the box after accomplishing each item on the checklist.

CHECK THAT

- Parts have not been damaged in shipment. Repair or replace items that are loose, dented or missing.
- All covers, guards and decals are in place and attached securely.
- Drive belt tension is properly adjusted.
- Flow gate can be adjusted to all positions.
- Hitch adapter is properly installed.
- Hitch pin is in place and retained.
- Controller and electrical wiring is properly installed.

Start the vehicle engine and place an X ☒ in the box after accomplishing each item.

CHECK THAT

- Unit does not start until **START** switch is depressed.
- Drive shaft and spinner rotate freely.
- Drive rotation is correct (clockwise from top of hopper).
- Speed can be adjusted through speed range with controller. (If variable speed controller is installed.)
- Burst sequence operates when **START** switch is depressed. (If variable speed controller is installed.)
- Listen for abnormal noises or vibrations; Repair or replace as necessary.
- Ignition switch safety shutoff functions correctly. (If on-off controller is used.)

DELIVERY CHECKLIST

The following checklist is to be accomplished with the customer present, place an X ☒ in the box after accomplishing each item.

- After giving the customer his operating manual, instruct him to read it **PRIOR** to operating the spreader. If he has any questions or does not understand part(s) of the manual, ask him to contact the dealer for answers or explanations **BEFORE** operating the unit.
- Record the spreader serial numbers, date of purchase, purchaser's name and address, and the dealers name, address and phone number in the space provided on page 1 of the owner's manual.
- Explain spreader connect and disconnect procedures.
- Demonstrate controller operation and burst function.
- Fill out Warranty Registration Card and mail COPY 1 to the factory to validate Warranty. NO Warranty claims can be honored if the Warranty Card is not on file at the factory.

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